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ABSTRACT

This guide is intended to introduce educators to the kinds of instructional changes necessary to provide students with adequate preparation for the changing world of the future. The guide is made up of three units divided into eight independent modules that can be used in individual study, workshops, university courses, and so on. These modules treat such themes as futures concepts, forecasting techniques, alternatives for future-oriented education, problem-solving skills for the future, and introduction of futures study into the educational program. These themes are related to the available literature, to which the user is directed. The guide concludes with a bibliography of futures-oriented materials, the most important of which are annotated. (Author/PJD)

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EDUCATORS' GUIDE FOR THE FUTURE

by

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November 1977

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INTRODUCTION

Educational leaders throughout the country recognize the fact that students need to prepare for a world vastly different from the one in which they are living today. Knowing this, they feel very strongly that instruction should be oriented toward the future and the knowledge and skills that the future will require. But, they ask, how should this be done? What emerging themes should be included in the educational process? And, what processes should be used in implementing futures-oriented education?

Educators' Guide for the Future is an orientation to some of these questions. It introduces educational leaders to the kinds of instructional changes that provide a valid futures reference and to the processes likely to be effective in making changes. Its content reflects Research for Better Schools' five years of study, planning and curriculum development for schools of the future.

The guide is made up of three units divided into eight modules. Unit I, "Toward the Year 2000," provides an overview of important futures concepts, factors, and forecasting techniques. Unit II, "Education for the Future," discusses basic themes, considerations, and alternatives for future-oriented education, reviews futures studies done to date, and addresses futures-oriented problem-solving skills. Then, Unit III, "Processes for Implementing Change," describes some of the processes of introducing a future-oriented emphasis into a school program and explains the leadership principles and problem-solving procedures involved. The volume closes with a comprehensive bibliography in which key references are annotated.

Any module in this guide may be examined independently of the others; however, there is a logical flow to their given order. Each module provides an introduction to a particular area of educational futures, a listing of recommended readings, and exercises if applicable. All activities relate to planning future-oriented changes in a school's educational program and may be adapted to the needs of individual schools and staff.

Modules may be used for individual study, in a workshop or seminar, or as part of a university course for current or future school leaders. When used as a general introduction to futures topics, each requires approximately one day of study time. If, however, the intent is to use the module as a precursor to actual change in a school's instructional program, additional study, planning, and implementation time will be necessary.

Users should have ready library access in order to take advantage of the wealth of materials on the future in general and on future-oriented education in particular.

Of major concern throughout the development of this guide and the selection of readings has been timeliness. As you progress through the materials, you will find many references to the rapidity of change. Familiarity with this concept and its implications includes awareness of the fact that a great many materials are obsolete almost as soon as they are published. This, undoubtedly, will be the case with some references given in this guide. Therefore, it is extremely important that the timeliness of any futures-oriented issue be taken into account in all your discussions and readings.

UNIT I: TOWARD THE YEAR 2000

This unit consists of two modules: Future Changes and Forecasting Techniques. The first provides an overview of important concepts and factors in futurism. The second describes techniques used in forecasting. Together, the modules familiarize the reader with the language, purposes and methods of futurism.

Module 1: Future Changes includes the following study/discussion topics: forecasting alternative futures; adapting to change or influencing change; psycho-social change; major change areas; rapid growth and change; and anticipating problems and planning ahead.

Module 2: Forecasting Techniques describes trend extrapolation; multi-factor forecasting using force analysis or cross impact analysis; forecasting alternative futures using future wheels, future histories, or scenarios; planning for desired futures using relevance trees or decision trees; group forecasting techniques using interview polling, questionnaire polling, the conference method, or the Delphi technique.

Module 1
Future Changes:
An Overview of Alternatives

This module is concerned with developing a conception of the nature of changes that are likely to occur during the next 25 or 50 years, and with determining, on an individual and subjective basis, disposition toward those changes.

The literature on alternative futures is vast and the reader can do no more than sample it. For those who have already read some articles or books on the subject, this module offers additional readings to help round out a well-considered viewpoint about alternative futures. For those who have not dipped into futures literature, this module offers a carefully selected set of readings that provides a good general introduction to the thinking of futurists.

The module consists of six discussion topics. The first three clarify some dispositions toward futurism and the future. The last three discuss reasons for studying the future and introduce possible areas of future change.

Recommended readings accompany each discussion topic. However, the reader may wish to skim through some of the publications which are annotated in the bibliography before beginning the discussion topics. Kauffman's Futurism and Future Studies, and the first chapter of Weinberger's Planning Schools for the Future are particularly recommended.

Adapting to Change or Influencing Change

Which has priority - adapting to change or influencing change? Individuals, groups, institutions, and societies can adapt to changes that have occurred or are occuring, or they can intervene to shape events either by counteracting problems that have arisen or by anticipating and preventing them from arising. Institutions can, if they wish, adapt to change in their values, knowledge, skills, or organizational arrangements and procedures. They can influence change just by the very fact that most change, technological developments or society's use of technology, for example, is created by humans and is therefore subject to control by humans.

Recommended Readings:

Weinberger, Planning Schools for the Future, pages 7-8.

Toffler, The Eco-Spasm Report, Chapters 6 and 7.

Ehrlich, Population, Resources, Environment, Chapters, 1, 7, 11, and 13.

Exercise:

Analyze the problem presented by pollution in terms of society's adapting to it or controlling it. Does economic necessity force us to accept pollution of the air by automobile exhaust gases? Must we accept pollution by oil spills and the disposal of wastes in our waterways? If we accept pollution, how do we adapt to it? What individual, group, or governmental approaches might bring pollution under control? If control is exercised in one area, say, industrial waste disposal, would other areas such as cost to the consumer or product quality, be negatively affected?

Instead of pollution, you may wish to examine alternative change topics - use of natural resources such as wood or copper, unemployment, or skyjacking, for instance.

Forecasting Alternative Futures

Why do futurists advise us to take into account possible or probable alternative futures of society and its many aspects, i.e., economics, government, education and so forth?

Recommended Readings:

Educational Policy Research Center, Alternative Futures, pages 1-13.

Kauffman, Futurism and Future Studies, Chapters 2 and 3.

Weinberger, Planning Schools for the Future, pages 4-6.

Exercise:

When making or evaluating forecasts, futurists consider that which is possible, probable, and preferable. Given past trends and present data, many possible futures may be in the offing, but some are more probable than others and, subjectively at least, a few of them are preferable.

Forecasts on the future(s) of society in America range from Harman's "garrison state" to the "doing more with less Utopia" discussed by Fuller. What do you forecast? What social futures are possible, probable, and/or preferable?

Psycho-Social Change

It is argued that the more affluent a society becomes the greater is the interest of that society's members in psycho-social concerns. A poor person is concerned only with physical survival; a wealthy person has time to consider the self. Although the values, and therefore the behaviors, of a society change and then circle back, individual needs and desires evolve with growing affluence toward a greater interest in intangibles offered by religion, psychology, or philosophy. In the late

1960's these psycho-social concerns were exhibited by student protest, anti-war demonstrations, and women's rights movements, amongst others. The middle of the 1970's brought a surface calm. Although futurists such as Herman Kahn or John Platt present their forecasts in the form of scenarios about the possible futures of society, few if any futurists choose to determine one probable social future, and none choose to predict the behaviors likely to come about as a result of psycho-social change.

Recommended Readings:

Weinberger, Planning Schools for the Future, pages 14-25.

Wallia, C.S. (ed.), Toward Century 21, Chapters IV and V.

Exercise:

In the last 20 years terms relating to psycho-social change have been introduced or redefined. Consider the list of terms below. How would each have been defined in 1950? How would you define them today? What emotional and intellectual reactions do they evoke? Which would you expect to have a long-term impact on society? In 5 or 10 years which terms do you think may have become obsolete? What concepts may develop requiring their own terminology?

Affirmative action
Alternative life-styles
Commune
Drop-out
Equal rights
Group interaction therapy
High
Hippy
Marriage contract
Ms.
No-fault divorce
Single parent
Transcendental meditation

Major Change Areas

Much of the literature on futurism is organized around lists of major change areas. You should become familiar with such lists if you have not already done so. For instance, Weinberger's list includes the knowledge/technology explosion, global interdependence, critical economic and social problems, the cultural revolution, and change in authority structures. Each item on a list of change areas may be subdivided many times; subdivisions are then added or revised as new developments occur. A development in one area can, of course, impact upon other developments and change areas. This interaction of developments makes the definition or study of any change area extremely complex, and yet, it is becoming more and more essential to try to understand that interaction and to think in terms of interlocking systems.

Recommended Readings:

Weinberger, Planning Schools for the Future, pages 8-21.

Kauffman, Futurism and Future Studies, Chapter 4.

Toffler, Future Shock, Chapters 9, 10, and 12.

McHale, The Future of the Future, Chapter 4.

Exercise:

The critical question about developments within any of these change areas is when are they to be seen as advantages and when are they to be seen as problems requiring a solution? If a particular development is

not an immediate problem, could it cause a problem? Could it become a problem? Under what conditions could the development be an advantage? A problem? Technological developments offer a good area of analysis here. Consider one of the following: robot "slaves"; computer "teachers"; audio-visual "vigilantes".

Rapid Growth and Change

Universal, rapid, and often unpredictable change has a profound impact on the individual whatever his or her age, occupation, or status. Every aspect of one's life is affected by changes continually taking place. Economic factors are probably the most obvious - inflation, changes in jobs and job requirements, unemployment, rising taxes, threats of failure in our social security system, and the possibility of a general collapse of the world economic order. Toffler advises that the individual "must search out totally new ways to anchor himself, for all the old roots - religion, nation, community, family, or profession - are now shaking under the hurricane impact of the acceleration thrust." Toffler is not advising adaptation or control, but a search for an "anchor" as a temporary stay against the storm of change, or possibly as a slightly more permanent hold on something other than familiar roots. He offers no prescription.

Recommended Readings:

Kauffman, Teaching The Future, Chapter 4.

Toffler, Future Shock, Chapters 1, 2 and 3.

McHale, The Future of the Future, Chapter 3, part 1.

Exercise:

Imagine yourself five years from now. What changes would you forecast in your job? How about your life-style, leisure-time activities, and family? Can you imagine a problem that you will need to solve within the next five years that is unlike any problem you have known in the past?

Consider the following: it took 112 years between the discovery of photography and its application, 56 years for the telephone, 12 years for television, 3 years for transistors. Of all the books ever produced, more than half were written in the last 50 years. Knowledge and communication are areas affecting everyone, especially those people involved with education. Can you keep up with the "knowledge explosion?" How might this knowledge be communicated 10 years from now?

Anticipating Problems and Planning Ahead

Earlier discussions in this module introduced topics on the rapidity of change and the interaction of developments in major change areas. Those topics represent two reasons for the growing relevance and importance of futurism. A third reason involves anticipating problems before they occur in order to plan ahead. Problem-solving and planning are discussed in Unit III. However, it is useful at this point to consider ways in which techniques of futurism may be used in these areas.

Recommended Readings:

Bright, A Brief Introduction to Technology Forecasting: Concepts and Exercises, pages 1-3, 1-4, and Chapter 3.

Rosen, Future Facts, pages 77-95 and 131-150.

Kahn and Wiener, The Year 2000, Chapter 10.

Exercise:

Consider population trends where you live. Will school enrollment increase or decrease within the next 2 years, 5 years, 10 years? If enrollment fluctuates, what are the probable positive and negative consequences to school buildings, faculty, and students? How might possible problems be anticipated in order to plan ahead?

Consider the energy crisis. What problems may be anticipated in heating or cooling school buildings and in providing transportation? What alternatives are feasible, not only in energy supplies and their use, but also in optimal use of buildings? How might planning now alleviate problems likely to occur within the next 5 years?

Module 2
Forecasting Techniques

Dozens of methods of forecasting the future have been developed. In this module, only a few are presented. The student who wishes to learn about additional methods is advised to turn particularly to the Hencley and Yates volume cited in the bibliography.

There is a fundamental distinction between forecasting methods used to anticipate what is likely to happen and those used to propose what will need to be done in order to achieve some desired future goal. Robert Beck calls these two approaches, respectively, the "exploratory-indicative" and the "normative" approaches. The former, according to Beck, means "that trends projected can be identified in what already exists; one's effort is to extrapolate." The latter approach means that "the forecasts attempt to envision future needs and goals and then to work backward toward the present," (Hencley and Yates, pp. 413-414). Take an individual's life span, for instance, perhaps your own. Your doctor could warn, "If you keep on drinking all those martinis you'll probably be dead before you reach sixty." This is forecasting what is likely to happen. Or, the doctor could promise, "If you want to live into your 70's, your chances will be a lot better if you cut down on the martinis and get some daily exercise." This second example illustrates what probably needs to happen to lead to future goals. Both forecasting approaches are discussed in this module.

Overall, the methods presented in this module fall under five headings. The first is trend extrapolation - given knowledge of the history of a topic up to the present, what is to be expected if the same trend continues into the future? The second heading is multi-factor forecasting, which takes into account the interactions of two or more sets of factors in making projections. Two methods under this heading are force analysis and cross-impact analysis. Under the third heading are methods for forecasting alternative futures. Included here are the scenario method and the development of "trees" of alternative futures. The fourth heading deals with planning for desired futures. One method that falls under this heading is creating "relevance trees." Finally, the fifth heading covers group opinion-gathering methods that are applicable to any forecasting methods. These include the conference method, general opinion polling, and the Delphi approach.

Recommended Readings.

The following books are excellent sources of information about methods of forecasting the future.

Kauffman, Teaching the Future: A Guide to Future-Oriented Education.

Hencley and Yates, Futurism in Education: Methodologies.

Gordon, The Futurists.

Bright, A Brief Introduction to Technology Forecasting: Concepts and Exercises.

Trend Extrapolation

The most common way of viewing the future is to project that current trends will continue. Thus, we expect that population will continue to increase, that the average life span will grow longer each year, that the depletion of resources of energy and food will continue, and that technological advances will occur at an ever-increasing rate. (Notice that almost all examples or discussions of trend extrapolation relate to statistical trends. Social trends are extremely difficult to forecast.)

As Kauffman has noted, while forecasting the future on the basis of current trends is very risky, the examination of trends has great value in identifying issues or problems requiring attention. Most of the problems that concern us in the present and in the anticipated future have resulted from trends that have been evident for a considerable period. This is the case with population increase, mounting pollution, the depletion of natural resources, increasing crime and international terrorism, the armament race, inflation, and many other urgent problems.

Exponential Growth

In projecting trends into the future, it is vital to recognize that many trends have an accelerating rather than a steady rate of change. For example, the rate at which natural resources are expended increases each year as technology advances, as the world's underdeveloped countries move toward industrialization, and as population increases multiply consumer demands. Also it is essential to recognize that, even though the growth

rate involved in a trend remains the same, the quantitative aspects of change accelerate because each year's increment adds to the base from which the next year's increment is derived.

Recommended Readings:

Bright, A Brief Introduction to Technology Forecasting: Concepts and Exercises, Chapter 6.

Gordon, The Futurists.

Rubin (ed.), Educational Reform for a Changing Society, Chapter by Jonas Salk.

Exercise:

Futurists agree that the continuing "population explosion" presents one of the world's most urgent problems. From a world population of about three-quarters of a million in 1750, the growth trend has led to a population of about 4 billion today and a projected figure of about 7 billion by the year 2000.

Consider the population trend in neighboring Mexico as an example. In 1950, Mexico's population was about 25 million. By 1975, it had grown to about 60 million. Presently, Mexico's population increase is about 3 million persons per year.

Your task now is to compute when Mexico's population can be expected to double to 120 million from the 1975 base of 60 million, assuming an annual growth rate of 3.5 per cent. Compute the doubling rate by using the rule of 70; that is, divide the growth rate of 3.5 per cent into 70 to determine the number of years until Mexico's population would double if the present growth rate continues. Your answer: 70 divided by 3.5 = _____ years. 1975 + _____ years = _____, the year when Mexico's population would be expected to reach 120 million.

What are probable consequences for the Mexican people if the population increase goes unchecked until the year 2000?

What are likely consequences for United States/Mexican relations if Mexico's population increase goes unchecked? (At present, between 1,000 and 2,000 Mexicans each week illegally cross the Rio Grande into the United States in search of work.)

Multi-Factor Forecasting

Any change in human society inevitably results from a complex set of interacting forces. Forecasts that do not take these forces into account are highly questionable. Two forecasting methods that pay specific attention to active forces in an area of investigation are force analysis and cross-impact analysis. The former calls for identifying and forecasting a trend for each of the major forces influencing changes in the area; the latter focuses on analyzing the interaction of such forces.

Force Analysis

In his chapter, "Force Analysis" in the Hencley-Yates volume, L.D. Haskew offers a six-step procedure for employing the method. He describes it as "one disciplined means of employing the construct of societal-forces-at-work in predicting future states of a given societal enterprise." (p.55)

Recommended Readings:

Culbertson, et al., Preparing Educational Leaders for the Seventies.

Morphet and Jesser (eds.), Cooperative Planning for Education in 1980.

Hencley and Yates, Futurism in Education: Methodologies, pages 55-68.

Exercise:

An important area of educational change involves school board, administrator, or teacher accountability for teaching students basic learning objectives. Incorporating accountability into American education would bring about great changes in school organization, instructional practices, and personnel policies and procedures. This exercise deals

with key forces that have to do with determining whether or not, when, or how accountability may be implemented in the schools.

The exercise assumes that you have a general familiarity with the topic of educational accountability. Also, it recognizes that you probably are not in a position to set up a team to conduct a force analysis on the topic. The heart of this exercise, then, is your projection of the direction and impact of a number of key forces bearing on school accountability.

What is your definition of educational accountability?

Cues for checking your answer: Accountability means that a school system, school, or teacher is required to produce certain learning outcomes with all students. To accomplish this, special remedial programs may be used. Failure to accomplish the designated learning outcomes may result in penalties of one sort or another--as state withholding of funds.

What are some key forces that influence accountability?

Cues for checking your answer: The following forces are among those that have been identified:

1. Public dissatisfaction with the failure of schools to teach basic skills well and to provide sound career education has led to citizen pressure on school boards and state governments to require accountability.

2. Legislative actions of more than 40 state governments have moved public schools toward accountability and some states have related school funding to accountability criteria.

3. The development of behavioral objectives, competency tests, mastery learning and individualized instruction have all provided resources for implementing accountability.

4. Work of the National Assessment of Educational Achievement has made it possible to measure the degree of student attainment of various school objectives.

5. The back-to-basics movement in education has stressed achieving mastery of the essential skills in language and mathematics.

6. Administrators and teachers are resistant to being held accountable for specified learning results with students and this is being reinforced by powerful unions.

7. Movements within education stressing affective education or open education have rejected a stress on behavioral objectives, achievement testing, and mastery learning.

What has been the trend of any one of the above forces during the past decade or so with respect to its impact on accountability? What is your projection of its likely impact on accountability during the next decade?

Cross Impact Analysis

Theodore J. Gordon pioneered the use of a cross impact matrix in forecasting. Professional futurists commonly follow his methodology, sometimes expanding it by using sophisticated computer programs. Gordon describes the cross-impact method as "an experimental approach by which the probability of each item in a forecasted set can be adjusted in view of judgments relating to potential interactions of the forecasted items."

Originally designed to determine the probability of an interacting set of forecasts, cross impact analysis has also been used to determine positive and/or negative impact of related developments, and to increase the depth of understanding of interactive relationships.

A cross impact matrix is a grid. Above the square of the grid, on the horizontal axis, and at the right of the squares of the grid, on the vertical axis, related forecasts or developments are given. By referring to a pair of developments (one on each axis) the forecaster completes each impact square in turn. Statements or symbols recorded in each square may relate to probability, negative or positive impact, needs or consequences.

Although forecasts based on cross impact analysis may be largely intuitive, they are nevertheless useful since they do consider interacting

forces.

The example below is from "Making Changes," a futures oriented course for junior high school students. This example is necessarily simplistic.

Purpose: To determine the impact of alternative courses of action upon certain individuals or groups.

Axis A: Each column relates to a specific person or group, (e.g., myself, my parents, my whole family, my friends.)

Axis B: Each row relates to a specific course of action, (e.g., I drop out of school, I graduate, I take a vocational course).

Recommended Readings:

Gordon, The Futurists.

Hencley and Yates, Futurism in Education, pages 117-126.

Bright, A Brief Introduction to Technology Forecasting: Concepts and Exercises, Chapter 11.

Exercise:

If the technological developments were a reality, what would the impact be on educational developments?

TECHNOLOGICAL DEVELOPMENTS

	Cable TV with educational channels available in schools and homes	Home TV-linked individual teaching machines with video response unit	Biomedically induced changes in mood, memory or concentration
[illegible] education for students			
Changing roles of teacher			

Forecasting Alternative Futures

Two methods of projecting what the future may be like are scenario writing and conceiving alternative futures. These methods have much in common. Both project a future state of society as a whole, or of some aspect of it such as the economy, government, or education. The main difference is that conceiving alternative futures - or "futures histories" - attempts to identify the full array of plausible futures while the scenario method usually presents only one, two, or three conceptions of what the future may be like. Both methods derive in part from the history of future projections reaching back to Plato's Republic and continuing with More's Utopia, Thoreau's Walden, H. G. Wells' War of the Worlds, Aldous Huxley's Brave New World, Orwell's 1984, and the recent Walden II by Skinner.

A third, very simple method, is known as the Future Wheel. Although not as sophisticated as future histories or scenarios, future wheels are related to the two since all three methods rely to a large extent on intuitive forecasting.

Recommended Readings:

EPRC Report, Alternative Futures and Educational Policy.

Purpel and Belanger, Curriculum and the Cultural Revolution, Chapter 1.

Kahn and Weiner, The Year 2000, pages 262-266.

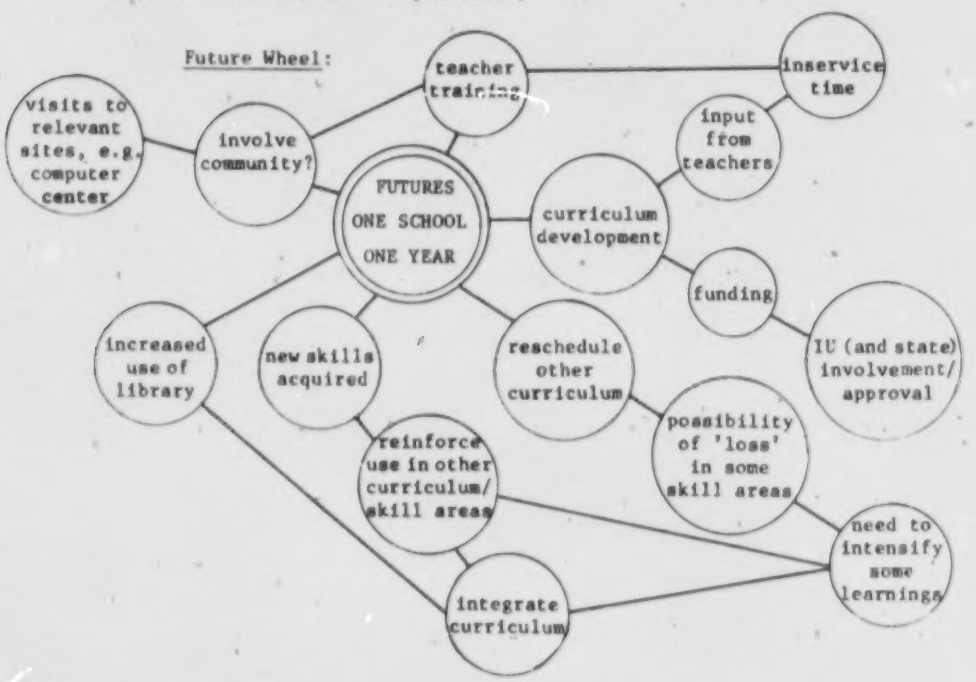
Future Wheels

This technique, developed by Cindy Guy and Jerry Glenn, and described in the August 1976 issue of The Futurist, is an intuitive study of needs and consequences likely to develop from a given forecast. The forecaster notes the development to be studied and circles the statement, thus forming the hub of the wheel. As needs and consequences come to mind, the forecaster records them in satellite circles on spokes from the hub. Statements in the satellite circles in turn suggest further needs and consequences which are noted.

Example: Challenge statement: *INTRODUCE A FUTURES STUDIES MINI COURSE IN ONE ELEMENTARY SCHOOL. PILOT DUE TO BEGIN IN ONE YEAR.*

Use your challenge statement as the focus of a future wheel. Use the future wheel to identify needs and consequences of the implied action. (Try not to be critical of yourself.)

Future Wheel:



Future Histories

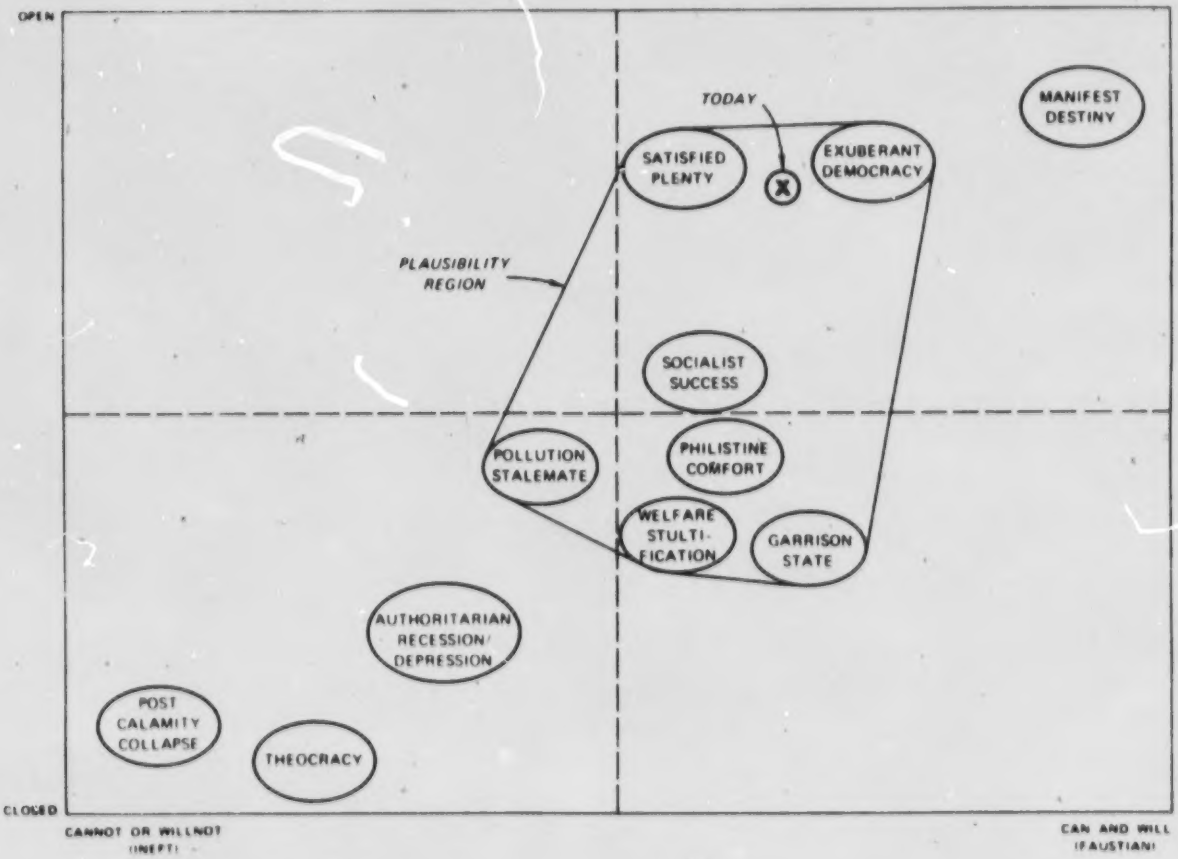
In projecting alternative futures, the usual starting point is to select some future year (say, 2000 A.D.) and to lay out an array of outcomes that might exist at that time. Most often the outcomes considered are over-all conditions in national or world society with special attention to such areas as government, economics, health, education, and international relations.

Once an array of future outcomes (conditions, states) has been projected, the task is to fill in the period from the current time to the selected future date with a plausible sequence of events leading to each alternative. As an example, one might project a nuclear war by 2000 A.D. as one alternative, and the avoidance of such a war as another. The task then would be to outline a likely train of events leading to each of these alternatives.

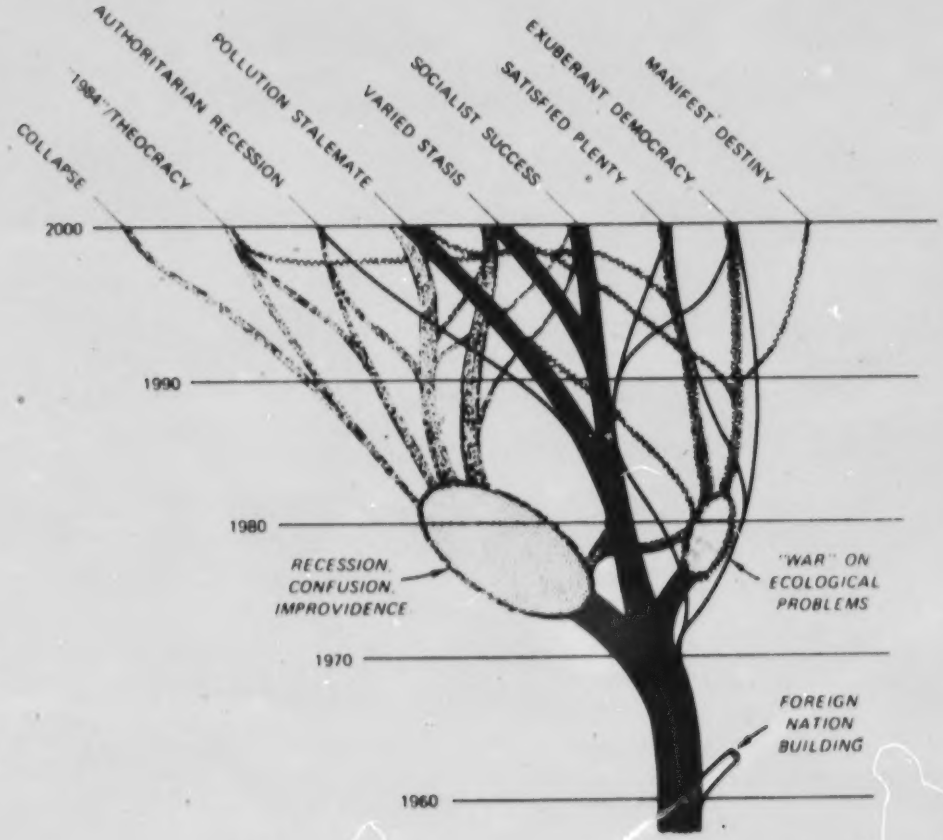
Such projected courses of events leading to different futures have aptly been termed "future histories." They provide a broad framework for thinking about the future. They offer contexts for identifying future opportunities and constraints, for judging the future efficacy of alternative policies and plans, and for designing programs that promise to bring into being a desired future history while avoiding others that are undesirable. An array of alternative future histories can point out tasks society must perform in the future and current premises that must be altered to avoid undesirable consequences.

Reproduced on the following page is a graph prepared by the Stanford Research Institute in 1970 giving an array of plausible futures as of the

year 2000 A.D. Note that the futures are plotted along two dimensions: (1) the degree to which society is competent and motivated to achieve goals it undertakes, and (2) the degree of openness of decision making (closed to open). The chart obviously presents a good-bad (desirable-undesirable) array of states with the "bad" end at the lower left and the "good" end at the upper right.



The same array of future states is presented in the "tree" of alternative future histories presented in the figure below. Note that the tree has a trunk representing the current state of affairs, then various "branch points" that identify crucial choices between alternative futures. Also note that the figure has a time line at the left broken into decades.



Exercise:

An excellent opportunity to try your hand at projecting alternative futures is provided by Willis Harman's article, "The Nature of Our Changing Society: Implications for Schools" that appears as Chapter 1 of Curriculum and the Cultural Revolution edited by David Purpel and Maurice Belanger. This optional exercise calls upon you to study Harman's article, then to prepare your own tree of alternative future histories leading by the year 2000 to each of three alternatives Harman names: a garrison state, a second-phase industrial society, and a person-centered society.

Scenarios

A scenario may take a variety of forms. It may be a chronological list of forecasted events; it may be a book such as Rachel Carson's Silent Spring or a science fiction novel such as Michael Crichton's The Andromeda Strain; or it may be a dramatic narrative paragraph within an otherwise dry textbook. Regardless of form, scenarios typically comply with certain guidelines. They:

- specify the forecast date
- identify the focus or main subject
- identify related subjects or issues
- present relevant information, especially that which identifies probable innovations
- assume that a no-change surprise-free future is least likely
- reveal imaginative consideration of alternatives.

Herman Kahn, considered by many to be a leader in scenario writing, discusses the usefulness and advantages of scenarios in The Year 2000.

Exercise:

Work with three or four colleagues to determine a topic or question of mutual interest, e.g., assume that teaching machines of one kind or another are used in all classrooms so that for 50% of each teaching day teachers do not teach but play the role of technician-in-charge. If this was true in the year 2000, and you were a teacher at that time, how would you describe a typical day?

Agree that each person must write a scenario in a given amount of time. Present your scenarios to each other, checking them against the guidelines presented above, and discussing the range of alternatives presented.

Alternative: Read and discuss the two scenarios which follow.

The two scenarios presented below were developed by the World Future Society and studied at its Second Assembly in 1975. They present two extremes, having been exaggerated deliberately to present an envelope that would contain most plausible alternative futures. Scenario 1 offers a pessimistic view of the future that assumes that current problems worsen rather than become resolved. Scenario 2, on the other hand, assumes basic changes in society that resolve major current problems of the world.

Scenario 1: About 300 million U.S. population concentrated primarily in large regional agglomerations (megalopolises) near the coastal and Great Lakes areas.

The mishandling of human and material resources -- energy, mineral ores, professional knowledge, etc. -- has resulted in a highly tense, regulated, reactive, and suspicious society. The casualties of unplanned technology -- the dropouts, the unskilled, the addicts, the broken families, the lonely suburban housewives -- continue to increase.

A cyclical economy, moderate unemployment and underemployment until the end of the century. Twenty percent of the people constantly live below poverty line. Fairly large generational, ideological, and cultural schisms. A large proportion of the annual GNP is spent in mediating conflicts, in restoring the

quality of the natural environment, in police protection, and in maintaining a decent level of social civility.

The gap between technologically advanced societies and the Third World countries continues to increase. By the year 2000, five major famines in the Third World countries have occured. The unplanned settlement of the sea has given rise to water pollution and has minimized the utility of the sea as a source of needed supplies.

An energy economy built upon nuclear fission with breeder reactors has developed. A large number of nuclear plants have been constructed in advanced industrialized economies.

Small-scale wars, with some low-level U.S. involvement, continue. However, since at least ten of the less technologically advanced countries have marshalled nuclear capabilities, the threat of a nulcear holocaust has reached its peak. Also, threats of economic warfare become a continuing source of concern.

Educational achievement and political participation depend on socio-economic status. Slowly decreasing, but considerable, age, sex, and ethnic discrimination. Free choice is very limited, and strong pressures exist for conformance to a common ideology. Strong emphasis on spectator sports such as football, soccer, basketball, etc.

Scenario 2: About 300 million population concentrated primarily in large regional agglomerations (megalopolises) near the coastal and Great Lakes areas. Revitalized small neighborhoods within well-functioning metropolises. People spend more time in family and community activities, ride bicycles, communicate instead of commuting, walk to work in high-density urban settings, and in general appreciate the diversity of options available to them in the context of metropolitan life styles.

Through effective technology assessments and anticipatory social planning, society has carefully managed its limited resources, and hence can promote diversity of cultures and ideologies at the national, regional, and local levels.

Many farm families who were driven away from the farms because of prevalent energy-wasteful policies have returned to small-scale farming. A more balanced population distribution has yielded benefits in terms of human satisfaction and has, through the concomitant energy savings, bought us the needed time for more intelligent and thoughtful energy development

choices. By the year 2000 the required research and development for improving the efficiency of geothermal energy and for solar cell has opened up new energy options.

A global communication network has been completed that significantly contributes to international cooperation and world peace. This network has promoted improved information dissemination among different cultures. It also has led to decision-making by governments that is more responsive to human needs.

Work, leisure, and other "goods" are fairly evenly distributed. Balance of equality and individual freedoms. Emphasis is placed on enhancing individual choices and options. Education is holistic in nature, striving to prepare the citizen for a society which enjoys highly individualistic life styles, but requries strongly participatory and anticipatory government.

Planning for Desired Futures

The purpose of future study is not merely to forecast alternative futures. Instead, its chief justification is that it offers opportunities to create plans for influencing events in ways that make the occurrence of desired futures more likely. The scenario method and the method of conceiving alternative futures provide analysis of what futures may occur by a given date and identify a chain of forces and events that would lead to each alternative future. Planning to foster the occurrence of a desired future then calls for working out ways of gaining control of the forces that will most likely lead to the chosen future. At the same time, it calls for planning ways to impede those forces that probably would lead to undesired futures.

Relevance Trees

The relevance tree offers a technique to use in planning for desired futures. Relevance trees are linear graphs that display logically derived sequences or hierarchies of events that should lead to the attainment of desired goals. They allow planners to display alternatives from both long-range and short-term perspectives, thus facilitating strategic as well as tactical planning. They can help alert future planners to events/actions to be pursued and events/actions to be avoided through comprehensive, logical mapping out of all essential alternative courses of action. It is important to note, however, that relevance trees display essentially linear pathways to goal attainment. They model a sequenced chain of events without the feedback loops and recycling characteristic of systems planning techniques (such as cross-impact analysis).

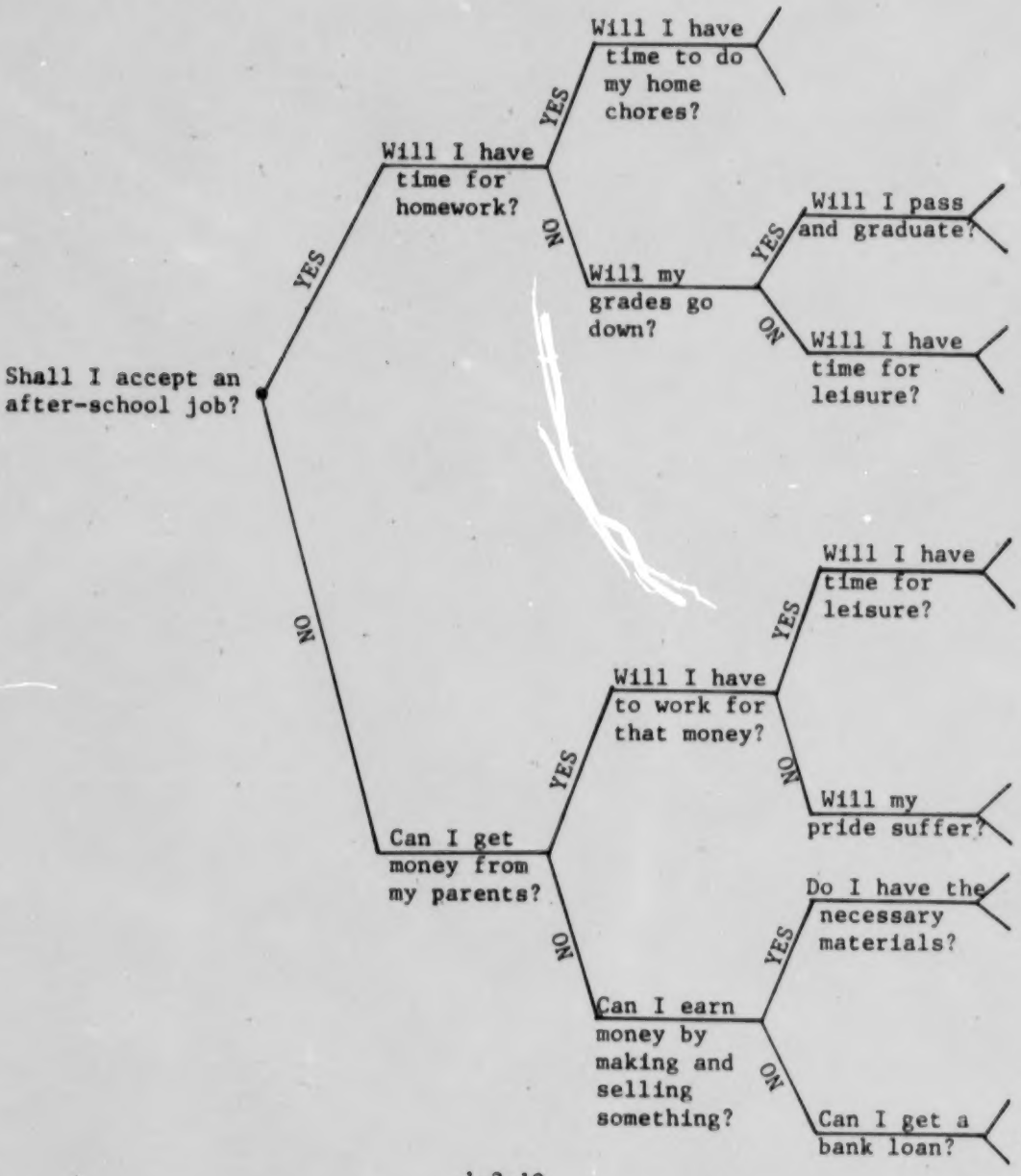
McGrath's chapter on "Relevance Trees" in Futurism in Education, edited by Hencley and Yates, is a good source for learning more about relevance trees.

Decision Trees

A decision tree is a greatly simplified version of a relevance tree. It grows from a series of simple questions each requiring a "yes" or "no" response. Decision trees are described in Laconte's Teaching Tomorrow Today.

The following example illustrates how a student may develop a decision tree based on the question "Shall I accept an after-school job helping at a super market?"

Example of a Decision Tree



Exercise:

Develop a decision tree based on a question related to your personal life, e.g., Shall I spend a two week vacation in Florida, or shall I take a certain course at the University?

Work with your colleagues to develop a relevance tree based on a real and important educational objective in your area.

Group Forecasting Techniques

There are obvious advantages in applying the experience and ideas of different people to the conduct of future studies. Experts in fields related to the topics of a study have special contributions to make. Also, any people who would be affected by changes in areas under study can offer valuable information on "consumer" reactions to changes that might occur.

Various group methods of forecasting have been employed. This discussion describes four types of group methods: interview polling, questionnaire opinion polling, the conference method, and the Delphi technique.

Interview Polling

An excellent example of the interview approach is a recent study by Harold G. Shane in The Educational Significance of the Future. Shane spent four months interviewing 82 futurologists in "think tanks" or other types of centers for future study. The interview approach depends greatly on the interviewer's ability to select the right interview questions and to conduct questioning in a way that elicits accurate and full responses. Also, it depends greatly on the interviewer's skills in analyzing, integrating, and reporting various interviewee reactions. If these requirements are satisfied, the interview poll can provide in-depth reactions of individuals representing a great range of expertise or views.

Questionnaire Polling

One of the least expensive ways of polling opinions is through mailed questionnaires. However, this method should be used with caution since a number of difficult requirements must first be met if it is to be a successful poll. The first of these is choosing the right topics for which questions are to be written. For example, the purpose of a questionnaire could be to obtain opinions about what society will be like in the year 2000. Hundreds of topics are relevant to this purpose. Questions might be on government, economics, population, family organization, religion, mores, pollution, unemployment, crime, recreation, international relations, and a host of other topics. Which should it be? A general rule is to limit the number of topics so that several questions on each

can be asked. For example, questions about government might cover such matters as whether the present three branches of government will remain, what role federal and state governments will have in education and welfare, what civil rights provisions will be in force, etc.

A second set of requirements in opinion polling concern the construction or form of questions. Questions about the probability of events occurring call for responses on some form of rating scale such as a five-point scale of highly probable, moderately probable, 50-50 probability, moderately improbable, and highly improbable. Questions on alternative outcomes that may occur may be in a multiple-choice format with the respondent asked to check one outcome as most likely to occur, or to rank the alternative outcomes, assigning rank 1 to the one judged most probable, etc. Another way of dealing with alternatives is to use open-ended questions where the respondents are asked to write what they believe is most likely to occur and, perhaps, what they believe is next most likely. Rating-scale and multiple-choice questions can be easily scored and tabulated. However, open-ended questions have the advantage of obtaining information on what the respondent thinks without first being prompted.

A third critical requirement in opinion polling concerns choosing the population to be polled. Usually, sampling methods must be employed to obtain a representative group. The first question is whether the sample should be representative of the entire population or only of selected sub-populations such as college students, social scientists,

or members of the World Future Society. The rules for obtaining a representative sample of one or more population groups have been carefully worked out by opinion pollsters. Before undertaking any opinion survey, the novice is advised to study a practical account of polling methods such as in Research Methods in Social Relations by Jahoda-Deutsch-Cook, or to obtain assistance from someone who is expert in polling.

A fourth critical requirement in opinion polling is receiving returns from a high enough proportion of those sent the questionnaire to obtain a dependable measure of opinions. For example, if only ten percent of returns were received, there would be no way to determine how much reliance could be placed on the poll's findings. To maximize the percentage of returns, several approaches are valuable: keeping the questionnaire brief, clear, and easy to fill out; stressing the significance of the poll in a covering letter to encourage returns; and providing a stamped, addressed envelope. A follow-up letter to non-respondents is a good idea in cases where respondents are asked to sign their returns. Another way of encouraging returns is to promise respondents a copy of a report on the poll.

The Conference Method

Probably the most common approach to future study is the conference method. This method offers an appropriate process for conducting any of the content-referenced methods of futuring: trend analysis, force analysis, cross-impact method, trees of alternative futures, future

histories, scenarios, relevance trees, etc. For example, the conference group could start by examining trends in society or education in order to select the issue(s) or problem(s) to be studied. Next, the group might identify and analyze various forces at work in the problem area, then project how those forces would interact in future years to determine outcomes. The conference method could also be used to project alternative futures or to plan how to arrive at desired future outcomes.

As the term indicates, the conference method brings together a number of individuals to work together in the study of a topic. This group-process method can be used alone or in combination with other process methods--as when a conference member conducts a literature search on an aspect of the conference topic, or when the conference approach is supplemented with an opinion poll of non-conference members.

Two main requirements must be met for successful use of the conference method. First, the conference membership must be appropriate for accomplishing whatever future-study purposes are to be addressed. Second, the procedures for collaborative analysis and planning must be effective.

With regard to conference membership, any group of persons might be appropriate, depending on the purposes of the conference. If the purpose were to plan future-oriented changes in a school program, the conference group might be made up of local administrators, teachers, parents, and students. A conference group concerned with projecting future uses of computers in society might be made up of experts chosen for their knowledge of computers or representatives from business and

industry, communications, or social forces generally.

In selecting conference members, care should be taken to ensure that the members work well together and that appropriate leadership skills (in helping select the group's topic, in setting up conference agenda, in leading discussion, in helping the group make judgments and develop plans, etc.) are present. The conference group should be small enough to allow each member to participate regularly and actively. If there are more than 12 or so participants, it might be desirable to divide them into work groups that meet separately from the full group. After performing their separate tasks, the work groups meet with the total group in full sessions.

With regard to effective conference procedures, the critical requirements are that the group keep on the appropriate track and that it proceed systematically through the stages of group problem-solving: defining the task, assembling relevant information, (perhaps through brainstorming), organizing information in relation to objectives, and arriving at group decisions about outcomes.

The Delphi Technique

This technique, pioneered in the 1950's by Olaf Helmer and his colleagues at Rand Corporation, is perhaps the most widely used tool developed for future policies research. It is based on the premise that many heads are better than one - or as Carl Sandburg phrased it, "Everybody is smarter than anybody."

The Delphi technique attempts to overcome the weaknesses implicit in a single expert, a one-shot group average, or a round table discussion. It is similar to conducting a series of individual conferences, but in writing. Three main characteristics exist: 1) each participant contributes input on the topic under investigation before seeing the input of others; 2) the inputs of others are anonymous; 3) there are a series of investigations in which all previous inputs are shared as part of the next input. As the name Delphi suggests, the goal of the technique is to collect opinions and establish consensus about future probabilities. It often deals with refinement of the exact nature of developments, the time and probability of their occurrence, possible consequences, desirability, and possible policy alternatives.

The Delphi technique has been badly misused because would-be forecasters have treated it as a universal tool. It should not be used if consensus can be determined more easily by a review of the literature. Nor should it be used in the middle of a controversy or if a large number of the invited respondents cannot or will not participate. The design and method of use are extremely important. The designer should: 1) identify the topic of research; 2) identify the respondents, preferable experts in the field; 3) conduct research on the topic and related recent developments, possibly by referring to the literature; 4) develop the Delphi statements or questions, using the following guidelines:

(a) being consistent by using <u>either</u> statements <u>or</u> questions, but not both and by using similar phrasing for each item;

(b) avoiding ambiguity by writing clear simple directions and by using concise simple language;

(c) avoiding double questions (e.g., When will A and B happen?);

(d) avoiding assumptions and leading questions (e.g., When will teachers have stopped striking for shorter hours?);

(e) being brief;

(f) allowing for a range of possible responses.

5) determine the nature and extent of the information to be collected, use scales, percentages, or time periods where practical, and allow space for comments, stating or suggesting the kinds of comments you would most appreciate.

Some forecasters invite respondents to particpate in an initial or preliminary stage of a Delphi by asking for revisions or additions to the questionnaire items. More commonly a forecaster conducts a series of rounds. The series of events is as follows:

1) respondents receive the Delphi in the mail. Usually they respond to each item by forecasting the probable date, the desirability, and sometimes the probability of each event.

2) on receiving the first round of responses, the forecaster tabulates the results, recording the averages on a Round 2 copy of the Delphi.

3) respondents receive Round 2 copies, each person seeing his or her own original responses and the averages. They may then revise or explain their original responses.

4) again the forecaster tabulates and averages responses, referring to revisions made in Round 2.

5) respondents receive copies of Round 3 and are once more invited to revise or explain their responses.

6) the forecaster tabulates and averages the final (Round 3) responses.

One of the earliest Delphis, used for industrial forecasting, is discussed and presented in its entirety in Bright's A Brief Introduction to Technology Forecasting: Concepts and Exercises. Chapter 10 of Kauffman's Teaching the Future is another valuable resource on use of the Delphi technique.

Exercise:

An example of a Delphi series is presented below. You are asked to fill in the sheets marked Rounds 1, 2, and 3 with your judgments, acting as though you were a member of a Delphi group of experts.

Assume that you and the other experts chosen have listed trends likely to occur in public education. The items presented in Rounds 1, 2, and 3 have been chosen from the list as part of the Delphi questionnaire. (Numerous other items normally would make up a Delphi questionnaire. The three presented illustrate the use of the Delphi technique.)

FUTURE FORECASTING STUDY: PUBLIC EDUCATION

DEVELOPMENT	Mark the column which indicates the time interval when the event is most likely to occur (Use x)					Please judge the desirability of the event (Use x)							Please judge the impact of the event on the quality of education (Use x)				REMARKS (Use reverse side if necessary; identify by item number
	Within 2 years	3 - 5 years	6 - 10 years	10 + years	Never	High Desir.	Medium Desir.	Low Desir.	Neutral	Low Undesir.	Medium Undesir.	High Undesir.	Very Great	Great	Moderate	None	
1. Society will become more open-minded towards the teaching of different standards in morals, ethics and cultures.																	
2. The State Legislature will enact many statutes dealing with curricula.																	
3. Adults having basic skill needs will attend school with school age students in regular classes.																	

ROUND 2

	Your previous estimate of time interval of occurrences	Group Consensus*	Please enter your current estimate of the time interval in which the event is most likely to occur (use x)					Please give reasons for your current time estimate if it is different from the interval in column two for each item
DEVELOPMENT			WITHIN 2 YEARS	3-5 YEARS	6-10 YEARS	10+ YEARS	NEVER	
1. Society will become more open-minded towards the teaching of different standards in morals, ethics and cultures.		Within 6-10 years						
2. The State Legislature will enact many statutes dealing with curricula.		Within 3-5 years						
3. Adults having basic skill needs will attend school with school age students in regular classes.		More than 10 years						

ROUND 3

	Summary of reasons provided by the group for his (later than group consensus) and low (earlier than group consensus) estimates	Your previous estimate	Group Consensus*	Please enter your final estimate of the time interval at which the event is most likely to occur				
DEVELOPMENT				WITHIN 2 YEARS	3-5 YEARS	6-10 YEARS	10+ YEARS	NEVER
1. Society will become more open-minded towards the teaching of different standards in morals, ethics and cultures.	*Later than:* Attitudes take a long time to change. *Earlier than:* Process has already begun.		Within 6-10 years					
2. The State Legislature will enact many statutes dealing with curricula.	*Later than:* Never legislate curricula. Educators, as a pressure group, will stop it. *Earlier than:* Trend has started. Spin-off of accountability movement.		Within 3-5 years					
3. Adults having basic skill needs will attend school with school age students in regular classes.	*Later than:* Social and emotional barriers. Best be handled in community colleges. *Earlier than:* Good use of vocational schools.		More than 10 years					

*Median

UNIT II: EDUCATION FOR THE FUTURE

In the modules that follow, the terms "future-oriented education" and "futures studies" are used. Each has a distinct definition.

Future-oriented education includes any and all knowledge, skills and dispositions which prepare students for their futures. At present, future-oriented knowledge could include or relate to such topics as population, pollution, food supplies, international politics or career preparation. Skills could include critical thinking, problem-solving, decision-making, as well as the traditional skills of reading, writing (or otherwise expressing ideas), and computing. Dispositions could include those relating to interpersonal relationships, motivations, changes and differences in values, among others. Future-oriented education is necessarily an evolving process, changing in accordance with the changing needs of the future.

Futures studies may almost be considered as a curriculum subject, somewhat similar to social studies. Futures studies may or may not be part of future-oriented education (although futurists would strongly advocate its inclusion).

This unit contains four modules. Module 1 presents six themes for future-oriented education. Module 2 discusses some considerations and alternatives for future-oriented education. Module 3 focuses on futures studies. Module 4 describes problem-solving skills.

Module 1
Themes for Future-Oriented Education

Education of any sort, for anyone, at any age, is preparation for the future. Yet much of what passes for education is focused on the past or the present and has little value as preparation for living in the years to come. This module identifies educational themes that are vital in preparing individuals to cope with the changing world. None of these themes, it will become apparent, is new; neither is the list intended to be comprehensive. The themes relate to: conception of crisis problems; possible rejection of basic premises; conception of alternative futures; response to change; psychological development and social responsibility; and problem-solving competencies.

Although these discussion topics have much in common with those in Module 1, Unit I, the emphasis here is on the impact of the themes upon the learner.

Recommended Readings:

Cornish, The Study of the Future, Chapters 9, 10 and 11.

Educational Policy Research Center, Alternative Futures and Educational Policy.

Heathers, "Education to Meet the Psychological Requirements for Living in the Future."

Kauffman, Teaching the Future, Chapter 2.

Phi Delta Kappan, September 1976 issue on "Yesterday, Today, and Tomorrow," articles by Amara, Harman, Shane and Wirtz.

Rubin, The Future of Education.

Shane, The Educational Significance of the Future, chapters 3 and 4.

Weinberger, Planning Schools for the Future, chapter 2.

Developing a Conception of Crisis Problems

A logical reference point for future-oriented education is becoming familiar with major societal problems that have given rise to futurism. If everything had been going well in economic, political, social, and personal spheres, we would not now be demanding leaders with heavy orientation and expertise in problem-solving skills.

Many futurists who have considered education for the future have begun by examining change and the mounting problems that it entails. For learners to become motivated to prepare for their own futures, it is important that they too develop a conception of, and a concern about, the major problems associated with change.

Recommended Readings:

Educational Policy Research Center, Alternative Futures and Educational Policy, pages 5-7.

Phi Delta Kappan, September 1976, articles by Amara, Bundy, and Harman.

Weinberger, Planning Schools for the Future, Chapter 1.

Stock, "Futures Studies in U.S. High Schools."

FUTURES PROBLEM AREAS

Exercise:

Table 1: Problem Areas, offers a list of problems derived from the "world macroproblem" in the Educational Policy Research Center (EPRC) reference on the preceding page. For each of these problem areas, you are asked to estimate its importance or urgency, and then to indicate the levels of schooling you believe should treat the problem. In indicating your view of the problem's importance, write 1 (highly critical), 2 (moderately critical), or 3 (not critical). If you think the problem should be treated at a given level of schooling, write "yes"; otherwise write "no."

Compare your responses with the survey results presented in Table 2 (from Stock's article referred to on the preceding page). Of the 184 schools surveyed, 54.3% were four year high schools, 29.9% were three year high schools, and 6.5% were middle schools or junior high schools. Each of the 28 topics listed in the table is clearly described in Stock's article.

Table 1
Problem Areas

Problem area	Importance	Level of Education				
		Elementary	Middle	High school	College	Adult
Natural resources (depletion)						
Pollution						
Overpopulation						
Unemployment						
Famine and plague						
The have/have not gap						
Nuclear weapons						
Terrorism and sabotage						
Invasion of privacy						
Genetic control						
Mind control						
Mental stresses from change and uncertainty						

Response key
Importance: 1 = highly critical
2 = moderately critical
3 = not critical
Level of education: yes = should be introduced/taught at this level
no = should not be introduced/taught at this level

Table 2*

Curriculum Topics: Ranking of Topics By Percentage of Respondents Including Topic in Their Programs

Curriculum Topic	%
Very High Degree of Inclusion (80.1-100.0 Percent)	
Alternative Futures	95.1
Population	94.5
Ecology and Environment	93.4
Communication	87.4
Family, Marriage and Sex	87.4
Energy	86.3
Society and Culture	85.7
Education and Learning	85.2
Biomedical Developments and Behavioral Research	84.5
Housing and Settlements	83.0
Natural Resources	81.9
Work and Leisure	80.8
Science Fiction	80.3
High Degree of Inclusion (60.1-80.0 Percent)	
Images of Man	78.6
Transportation	78.0
Nature of Change	70.3
Government and Politics	69.8
Production and Consumption	69.8
Futurists and Futures Studies	69.2
International Relations	67.6
Food	65.9
Values Clarification	65.9
Space	65.4
Moderate Degree of Inclusion (40.1-60.0 Percent)	
Legal System and Law Enforcement	57.1
Religion	54.9
Historic Conceptions of the Future	53.6
Arts, Entertainment and Sports	40.7
Low Degree of Inclusion (20.1-40.0 Percent)	
Systems Analysis	29.3
Very Low Degree of Inclusion (0.0-20.0 Percent)	
None	

*from Richard Stock, "Futures Studies in U.S. High Schools," World Future Society Bulletin, May-June 1977. Reprinted with permission of World Future Society Bulletin, published by the World Future Society, P.O. Box 30369 (Bethesda), Washington, D. C. 20014.

Evaluating Basic Premises

To deal realistically with change and the problems it involves, individuals must question and, frequently, reject premises and values that are basic to the current economic, social, and political order. We tend to maintain faith in outmoded institutions because of a belief that what has worked in the past will continue to serve our interests.

The EPRC report on alternative futures advises that "education should be directed toward responsible stewardship of life on earth with the associated changes in values and premises," (p. 10).

Shane contends that:

> ... we have the problem of changing our patterns of survival behavior from medieval attitudes of suspicion, self-aggrandizement, and competition for scarce goals. Our survival as human beings ... today depends to an increasing degree on mutual understanding, empathy, ability to reach agreement through interaction and reasonable compromise rather than by resort to force or "pull rank", (p. 47).

He notes that our "naive use of technology" has created severe threats to the environment on which we depend for survival.

Recommended Readings:

EPRC, Alternative Futures and Educational Policy, pages 9-10, 19-24.

Phi Delta Kappan, September 1976, articles by Amara and Shane.

Shane, The Educational Significance of the Future, pages 43-50.

Exercise:

Below is a list, paraphrased from the EPRC reference on the preceding page, of commonly held beliefs about society and its problems. For each one, indicate the extent to which you subscribe to it. Afterwards, you may wish to compare your answers with the questionnaire and discussion presented on pages 70-72 of Kauffman's Teaching the Future.

Premises, Beliefs, Reactions

Commonly-held belief	Your belief about this item: Generally true	Partially true	Very doubtful
1. Population increases favor the survival of the human species and the power of nations	___	___	___
2. Any technology that we can develop should be developed	___	___	___
3. People have little responsibility for the effects of present actions on remote individuals or future generations	___	___	___
4. Man is separate from nature and so can exploit nature rather than cooperate with it	___	___	___
5. It is legitimate to follow a system of economics based on ever-increasing gross national product (GNP)	___	___	___
6. The future of the planet can safely be left to autonomous nation-states operating mainly independently of one another	___	___	___
7. The belief that one should rely on impersonal bases (scientific method, statistical frequency, etc.) for dealing with human problems rather than on "humane" bases	___	___	___
8. The disbelief that we can achieve "what ought to be," replacing what has been and what is.	___	___	___

Alternative:

If it may be assumed that futurists have attempted to determine their own values and beliefs, and in so doing have evaluated -- and possibly rejected -- the "pathogenic" premises of the EPRC report, the question arises as to replacement. That is, what premises, values, or characteristics are espoused by futurists? The table below is based on a list of hypotheses presented in Chapter 9 of The Study of the Future.

Respond by checking the extent to which you consider each statement true of yourself.

Characteristic	Totally true	Partly true	Untrue
• Open to experience - ever searching for new ideas	_____	_____	_____
• Global outlook - thinking in global rather than national terms	_____	_____	_____
• Long-term time perspective - having a sense of human evolution through time: past, present, future	_____	_____	_____
• Ecological orientation - being aware not only of environmental problems, but also of the complex interaction of human and natural systems	_____	_____	_____
• Concern for humanity - having empathy for people in distant times and places	_____	_____	_____
• Rationalism - respecting objective and statistical data, rejecting mystical forecasting and irrational notions	_____	_____	_____
• Pragmatism - demonstrating interest and approval of effective, realistic, well-planned programs	_____	_____	_____
• Reality of choice - having an existentialist's concern about the act of decision-making	_____	_____	_____
• Interest in values - desiring happiness of all humans in all times and places	_____	_____	_____
• Optimism - believing that "if people will only use their heads, life will be much better in the years ahead."	_____	_____	_____
• Sense of purpose - hard-working and with a sense of mission	_____	_____	_____

Developing a Conception of Alternative Futures

Kauffman, in chapter 2 of Futurism and Future Studies, writes:

> At any given moment ... there exists a range of alternative futures ... History and physical reality determine which futures are in that range. Chance and human choice will determine which one of those plausible futures will actually happen (p.111).

In addition to recognizing the pluralistic nature of the future, the learner should understand that a complexity of interacting factors are also changing rapidly and continually influencing any given alternative in a variety of ways. Once these two concepts -- pluralism and complex interaction -- are understood, the more mature and sophisticated learner can begin to acquire the skills of forecasting alternatives.

Throughout the learning process the learner should develop a disposition balanced between the "two perilous attitudes" described by Professor Howard F. Didsbury in Chapter 11 of The Study of the Future.

> One is belief in a "technological fix" -- the notion that science and technology will snatch us back from the abyss just in time; this attitude tends to encourage complacency. At the other extreme -- and equally dangerous -- is the great temptation to exaggerate or overemphasize the complexities and difficulties that lie before us. Such an overemphasis tends to make the problems seem so great that students grow apathetic or feel completely ineffectual (p. 216).

Recommended Readings:

Kauffman, Teaching the Future, pages 40-42 and 132-133.

Cornish, The Study of the Future, pages 214-216.

Exercise:

Below is a list of optimistic views drawn from EPRC's Alternative Futures and Educational Policy. What is your level of belief in each of these views? Notice that the list was published in 1970. You may wish to respond to each item twice -- once imagining yourself in 1970, and then in the present. Afterwards, compare your two sets of responses, and relate them to the concepts of pluralism, interaction, and the "two perilous attitudes" of alternative futures.

Technological Fix-One Future Alternative

Commonly-held view	Probably true	Fairly reasonable	Highly unlikely
1. New technologies will control pollution	_____	_____	_____
2. A revolution in agriculture will solve the world's food problem	_____	_____	_____
3. New contraceptive approaches will control population	_____	_____	_____
4. Deterrance policies will protect us from nuclear war	_____	_____	_____
5. Urban programs will reduce our problems of racism	_____	_____	_____
6. America's world image will become satisfactory now that we are out of Vietnam	_____	_____	_____
7. American capital and know-how will lessen the have-have not gap	_____	_____	_____
8. Technological breakthroughs will overcome the depletion of natural resources.	_____	_____	_____

Responding to Change

A key educational goal for students in the future is the disposition to believe that both current and future problems of society are human creations and can be controlled or solved through human action. Influencing events is not limited to adults.

In Stock's survey (reported in the World Future Society Bulletins of May-June and July-August, 1977), 19 goals for futures studies programs are ranked by degree of acceptance as judged by the 184 schools responding. The seventh goal is "To help students develop the attitude that they can be actively involved in influencing their own future." Four of the remaining 18 goals are also related to individual commitment to active influence on events in order to improve present and future conditions.

J. Dan Cover, in an article in The Futurist, August 1974, stated that futures studies can counteract "symptoms of distrust, powerlessness, and a sense of personal meaninglessness felt by young people experiencing future shock." Only when the learner believes that individuals, alone or in cooperation with others, can influence events, will he or she take the necessary action, developing the futurist's characteristics listed earlier in this module.

Recommended Readings:

Cornish, The Study of the Future, pages 200-202, 205-208, and 221-224.

Toffler, Future Shock, pages 334-342, 371-377, and 402-405.

Exercise:

Mentally review the work you do, and the organizational system of which you are a part. Consider major organizational changes and the demands those changes have made on you. Were those major changes initiated within the organization, or were they more or less forced on the organization by external factors or groups? To what extent have you participated in determining changes in the system? In general, when changes occur, do you tend to ignore them, accept them without changing yourself in any way, adapt to them, or influence their direction and impact?

Developing a Self-Image and Social Responsibility

Many futurists stress the critical importance of psychological education as preparation for living in the future. Toffler's analysis in Future Shock of the pressures change, complexity, and uncertainty place on the individual is one basis for emphasizing psychological education. Another reason for accentuating education in the psychological realm is the need for individuals to associate more closely in dealing with the many problems brought about by change. Learning goals related to the sort of person-development called for include developing a "future-focused role image," achieving or retaining a positive self-concept, learning or determining moral and ethical values concerning others, and building leisure-time interests and skills.

Goals of social learning involve attitudes and skills for positive interpersonal, intragroup, and international relations. Included must be learning to relate to persons different from oneself with respect, understanding, and cooperation. This means relating effectively across sex, age, status, ethnic and nationality lines. The phrase "tolerance of ambiguity," used by Torrance, Kauffman and others, is relevant in

learning to relate to others.

Recommended Readings:

Heathers, "Education to Meet the Psychological Requirements of the Future."

Purpel and Belanger, Curriculum and the Cultural Revolution, Chapters 2, 9, 11, and 14.

Weinberger, Planning Schools for the Future, pages 35-40.

Exercise:

Make a list of major changes you would expect to occur by the year 2000. Describe some of the things you will be doing in the year 2000. Does your description take into account the ways in which your listed changes would influence your life-style, self-image, or relationships with others?

Learning Problem-Solving Competencies

Coping effectively with change, with the new and unfamiliar, requires that individuals be capable of analyzing situations and devising solutions to the problems they contain. In short, individuals need to become problem-solvers. This need for employing problem-solving skills rather than trying to use conventional "recipes for action" applies to all of one's life roles -- as learner, worker, family member, community member, citizen, and private person. Problem-solving includes capability in analyzing the values involved in situations calling for action, then choosing a course of action suited to chosen values.

Obvious correlates of problem-solving skills are capabilities and habits of self-direction in coping with new situations. Instead of turning to "experts" for answers or solutions, the individual needs to exhibit self-reliance or what Riesman called "inner directedness."

Problem-solving is discussed in greater detail in Module 4.

Module 2
Considerations and Alternatives for Future-Oriented Education

The literature abounds with analyses of past educational efforts, descriptions of educational innovations, and recommendations for both present and future endeavors. Most readers are probably reasonably familiar with such writings. However, you may be interested in re-examining some of the literature from a futurist's perspective.

The study topics in this module fall into two categories: considerations and alternatives. In the first - considerations - two of the three topics are based on concepts important to futurists, while the third is based on political impacts felt by educators. The second category - alternatives - refers to six sources and then summarizes recommendations.

The comments and references are by no means all-inclusive, but rather represent a sampling of some of the stronger and more current ideas.

The reader is highly advised to update the contents of this module should he or she decide to apply any of the ideas presented. Future-oriented education is necessarily an evolving process and that which appears in print today may be almost totally irrelevant in a few years time.

Future-Oriented Considerations

Limits to Growth

The phrase "limits to growth" has a specific meaning to futurists, who refer to findings of the Club of Rome, and the writings of Donella and D. L. Meadows, and argue that given finite resources and other limitations, growth and expansion must necessarily reach a point beyond which they cannot go. Although contrary to past attitudes and practices, the "limits to growth" argument is not necessarily in conflict with progress since it does not rule out change.

The most frequent cry heard from educators asked to consider or include yet another approach or course is, "There's enough to cover already; I can't possibly fit anything else in, and I'm not allowed to throw anything out."

However, education, unlike some industries, has not yet reached its growth limits, and in theory should be sufficiently flexible to anticipate, adapt to, and incorporate change.

Exercise:

In order to analyze some of the factors relating to limits to growth, either develop a cross-impact matrix, or complete the matrix which follows. The sample matrix given is not intended to be all-inclusive.

Assume that each item is possible (but not necessarily probable or preferable). Read each item as a command.* Note that items on the horizontal axis relate to increase, and that items on the vertical axis relate to decrease.

Determine the impact of each pair of items by asking yourself, "If both commands were obeyed, what would most probably occur? Is the impact positive or negative? Would certain conditions be necessary in order for this impact to be desirable?" Use statements and/or symbols.

Two impact squares have been completed as examples. Rewrite those impact statements if you consider them inappropriate. The items are clarified below, and presented in note form on the matrix.

- Decrease insulation -- Do not insulate "special" groups of students from each other or from courses offered.
- Decrease time -- Spend less lesson time on each curriculum or subject.
- Decrease knowledge -- De-emphasize the learning of information.
- Decrease teaching to test -- Discourage teachers from "teaching to the test" supposedly justified by the need for assessment of student performance.
- Decrease teacher talking -- Discourage teachers from lecturing or instructing the class to the extent that he or she talks more than any 25% of the students.
- Increase peer teaching -- Encourage students to teach and learn from each other.
- Increase the number of curriculum subjects offered to the students (i.e., offered but not always taught to all students).
- Increase the number of lesson hours per day, or for the year.
- Increase skills -- Teaching by emphasizing that which students can do rather than that which they know.
- Increase integration of curriculum subjects.

*The items presented are based on recommendations commonly found in current literature.

Limits To Growth

Cross Impact Matrix

INCREASE / DECREASE	peer teaching	# curriculum subjects	# lesson hours	skills	integration
DECREASE insulation	N = teacher training + I D				
Time (per subject)					
Knowledge					
Teaching to test				N = new/different student assessment + I D	
Teacher Talking					

KEY:
+ = positive mutual impact
- = negative impact
I = "increase" item desirable
D = "decrease" item desirable
N = need (defined by impact statement)

Rapidity of Change

Factors that influence the rapidity of change include the "knowledge explosion"; the increasing availability of technological teaching tools; fads, theories and innovations bombarding education, its goals and directions; the "back to basics" movement versus an increasing variety of innovative alternatives; the movement away from production and toward service employment opportunities; individual values and social behaviors; and many more.

However desirable it may be to take all of these factors into account, it is not always humanly possible. Awareness of the rapidity of change and its impact upon learning is both desirable and possible. The implication is that education, for any age group, should be designed to be in tune with time - not only for the "now" of a second grade, but also for the "tomorrow" of that second grade's final years in high school, and the "to come" of those students' careers.

This may mean that long-range planning is useless; continual short-term planning may be more appropriate. Alternatively, it may mean that long-range planning is absolutely essential and needs to be combined with short-term planning that is frequently updated in accordance with rapidly changing factors.

Recommended Readings:

Rubin, The Future of Education, pages 165-188.

Mandates, Politics and Fragmentation

Federal and state mandates or guidelines, particularly those related to funding, are increasing in quantity and dominance.

Increased unionization and teachers' political clout are irritants to administration just as administrative control of teacher evaluation and accountability are irritants to teachers.

Parents and other community members intensify their demands, and at the same time, feel disaffected.

The gaps between and among state departments and school districts, administrators and teachers, and schools and the community are increasing and becoming more frictional.

These factors are important considerations not only in planning for future-oriented education, but also in planning for any kind of educational change.

In an unpublished planning paper, Dr. Irving H. Buchen discusses these and other issues. Although the paper was developed for the state of New Jersey, the issues, trends, problems and recommendations it discusses have relevance for all educators.

With the author's permission, one page of the paper is included here. Notice that the language and layout are telegraphed - a deliberate design to improve the probability that everything will be read carefully.

Recommended Readings:

Buchen, Planning Paper DF-GT-III: Current and Future Policy and Planning Issues for Public Education.

DIVISION OF THE FUTURE--WORKING PAPERS: SUMMARY SHEET

Draft No. Final

Date 30 June 1977

_____ Policy
_____ Planning
_____ Curriculum

ISSUE: Futures Focus of Education

DESIRED OUTCOMES: No endorsement of any probable future; instead emphasis on adaptability curriculum.

TRENDS

Increased number of curriculum projects on study of future.

Increased number of curriculum adaptions studying aspect of the future--Bio-Futures, etc.

Most futures curriculum projects, especially from publishers, are superficial and scary (correlation?). One long weary procession of future shockers and problems. Overwhelming and debilitating.

Educations futures research and curriculum development generally lags behind that in all other areas. Often the least sophisticated and methodological.

PROBLEMS/OPPORTUNITIES

1. Futures has gee-whiz, faddish image in education.

2. Many teachers believe futures is current events; actually coming attractions.

3. Two cultures problem in futures as well--soft and hard split.

4. Present momentum is regressive: back to basics. Difficult to sustain additional thrust forward to futures basics.

5. Few opportunities for training teachers in futures, let alone educational futures.

RECOMMENDATIONS

1. Education is not a corporation. A corporation providing products and services has to opt for a probable future on the basis of trends. No such clarity available to education. In addition, education is on an incredible time line. Five year old in K in 1977 will graduate high school in 1990.

   Recommendation then is that education cannot put any of its eggs in one basket--slow or zero growth, intermediate growth or growth boom. Besides, that five year old will live the bulk of his or her productive life in the 21st century which may be space-rather than earth-centered.

2. Paradox: the most futures oriented curriculum then may be the least explicitly futuristic. Instead, the commitment to adaptability to a number of different futures may be its essential futures thrust.

Future-Oriented Needs and Alternatives

The Views of Experts

This section refers to five sources, selected to be as representative of the literature on educational futures as possible. The sources are presented in chronological order by publication date. The author's or editor's suggestions are listed but not discussed. The reader is advised to refer to the original sources in order to understand fully the meanings and implications of the items listed. The sources are: Educational Policy Research Center, Shane, Weinberger, Kauffman, Heathers, and students. Since Heathers' themes are presented in Unit II, Module 1, they are not presented again in this section.

Educational Policy Research Center, Alternative Futures and Educational Policy, 1970, pages 14-40.

The "tentative and preliminiary" results presented here are based on "internally self-consistent alternative futures likely to occur by the year 2000." The report was prepared for the Bureau of Research, U.S. Office of Education, and includes six directives:

1. Direct attack on the world macroproblem;
2. Control technological development and application;
3. Alter values, perceptions, and premises;
4. Establish a sense of national purpose;
5. Meet the educational demands of varied groups;
6. Educate for coping with an uncertain future.

Shane, Harold G., The Educational Significance of the Future, 1973, pages 83-86.

Shane's book is an adaptation of a report prepared for the U.S. Commissioner of Education in 1972, and is based on "interviews with eighty-two specialists in many of the nation's 'think-tanks' and centers for probing the future." In chapter four, "Learning Designs for Tomorrow," Shane proposes a "seamless continuum of learning" which includes a paracurriculum, and describes seven "emerging characteristics of curricular content designed for the future."

1. Social discipline - "advance toward new values and life styles";
2. Non-materialism - "changing our 'thing-centered' values and appetites";
3. Technology 'rethink' - attack "the problems of naive use of technology";
4. Biosphere concern - "respond ... to the threat of damage to the biosphere";
5. Equity in democracy - "discard the dream that everyone can rise above his father's status in life";
6. Population control - "sensitize ... to the problems of ... unrestricted breeding";
7. Mass media control - "cope with the potential power of mass media in shaping opinions and attitudes";

Weinberger, JoAnn (ed.), Planning Schools for the Future, 1976, pages 29-40.

This volume presents results of a three-year project for the National Institute of Education and includes opinions about future trends and their implications for education by prominent educators and other distinguished individuals. Chapter four - Future-Oriented Themes for Education in the

1980s - lists these ten educational goals:

1. Problem-solving skills;
2. Skills in self-managed learning and action;
3. Competency motivation;
4. Career education;
5. Citizenship education;
6. Interpersonal and intergroup attitudes and skills;
7. Values education;
8. Psychological education;
9. Education for leisure;
10. A future-focused role image.

Kauffman, Draper L., Teaching The Future, 1976, page 30.

Drawing on the resources of the Futures Studies Program and the School of Education at the University of Massachusetts, as well as his experience in field testing ideas and activities, Kauffman presents a practical book written expressly for teachers. Chapter two, "The Future-Oriented Curriculum," includes a comprehensive table of objectives in six competency areas.

1. Access to information;
2. Thinking clearly;
3. Communicating effectively;
4. Understanding man's environment;
5. Understanding man and society; and
6. Personal competence.

The Views of Students

Today's students are said to be the most tested and surveyed group in the history of education. This, say some, frequently makes it difficult to obtain honest and articulate responses from them. Also, in some cases the surveyor's task is complicated by the fact that students are unaware of the range of possible alternatives and tend to choose known and well-worn pathways rather than new and different trails.

Some studies and reports do exist which relate to students' perceived needs or attitudes to the future, or, more frequently, present results of tests and measures. However, most truly relevant reports are well-buried in the literature, and even when found tend to be ignored by educators.

Research for Better Schools staff have collected some data from students, part of which is presented here. The number of contributing students is small, and the participating group is highly selective. However, if education is to be consumer oriented, it may be argued that a little information is better than none.

Gifted Students' Opinions

The Pennsylvania State Department of Education issued a mandate in 1976 calling for identification and special teaching of gifted or academically talented students. The Kennett Consolidated School District, located 35 miles southwest of Philadelphia, serving a mixed semi-rural population, identified gifted students as those with an I.Q. of 130 or above. Following a very small pilot program in 1976, full-scale programs

began in the fall of 1977.

Fifteen 9th and 10th graders were identified for the academically talented program (ATP). The program consisted of two class periods per day, covering humanities and language arts.

In September 1977 these ATP students were asked to answer the questions below. They accepted the task for two reasons: first, they wanted their ideas to be published; second, they hoped that their opinions would be seriously considered by educators. None of these students had been exposed to futures studies or futuristic concepts in school.

The assigned questions were:

What should you learn during the next three years? What do you need to know, and what do you need to be able to do by the time you leave school?

What should present 5th graders learn in their last three years of high school? They will begin 10th grade in 1982 and graduate in 1985. Will society, employment opportunities, available technology etc. be so different by 1985 that present 5th graders will need to learn different knowledge sets, skills, and dispositions from those you need to learn?

Students completed their responses in four class periods. The class teacher was present at all times but offered no guidance or instruction. The four sets of responses were generated by three groups and by one student working independently. Responses are presented as they were written, and quoted verbatim. Contributors are named at the request of the students.

The brief essay below, referring to basic skills, social responsibility and individual motivation, was written by Greta Olson.

> The most important thing I, and my fellow classmates, can learn in our school years is the knowledge to be able to read, write and do at least simple arithmetic. With these tools a person is open to most ideas, fields, and occupations.
>
> I think all students need to feel a sense of responsibility, with this quality they will be better students, citizens and people. To give students this sense the school could give each student an animal or a garden to take care of. It would be to the students own emotional advantage to see his animal grow. I think if this program was at all successful it would increase the student's pride in himself and his work.
>
> The most important thing a school could give a student is an interest in learning. By opening a person's eye to at least one idea or field that made the student want to know more, the school would be giving the student a key to the world.
>
> I am bored by most of what I am taught school. I accept it as being a competitive game for helping me to be successful in life. This worries me because I am supposedly a good student. Perhaps my dissatisfaction won't last, I hope so.

The following essay, by Mary Griffith, Rhonda Petrucci, Neal Clark and Donald Smith, insists on minimum achievement standards in basic skills; advocates ability grouping, small classes and well-trained teachers; identifies subject areas - including life skills; and refers to competency motivation and social responsiblity.

> We think schools today don't teach students as well as they should. Many kids graduate from high school without knowing how to read or do simple math. This sort of thing is not right. The education in public schools should be improved. Schools should set a minumum of things that students must learn before graduating. If they don't learn these things, (such as four years of English and arithmetic, being able to read well, etc.) they should be kept in twelth grade until they do. That way, no one would graduate with the education of a seventh or eighth grader.
>
> But all students are not equally intelligent, so the school should set up programs for those who have a learning disability, or those who are smarter than others. Also, sections (or classes), should be organized for the whole school according to ability of the pupils. In other words, ability grouping. This prevents students

who learn fast from being handicapped by the slower students.

We also think the classes should be smaller. Kids learn better when the class is small because they can have more individual attention from the teacher. And the teachers themselves should get good training. High schools should make sure their teachers are well qualified. In elementary and middle school it is not so important, but in high school students are learning subjects which will help them get a job later. The teachers should be the best the school can find.

The subjects taught in school should be carefully chosen. First of all, the school should provide courses in English, math, and some kind of history, to give the students the general background of what they should know. Second, there should be classes on how students will live after they graduate - the responsibities of marriage, of being a family member, how to take care of children, and other things related to it. This is, in our opinion, an important thing to know. Students can be prepared to be adults and can make out better in the world if they are taught what to expect and what to do beforehand.

Along with these subjects there should be elective classes. Students could pick a subject that interests them, so they would most likely learn that subject well. And schools should provide advanced courses in the electives, instead of just beginner classes. That way the student can master whatever subject he wants to learn.

Wanting to learn is the key factor. The school has to have a nice atmosphere and offer a variety of classes to make students like it. We feel that if the kids in the next decade enjoy school, they will learn a lot more and will teach their children more, and our society will become more advanced and will be a better place for kids of the future.

The four members of this group - Ray Leto, Bobby Giancola John Garn, and Danny Suwyn generated a table (chart) and a list of statements. The statements, from individuals, are presented as if they are quotations from an article along with a mythical copyright (a touch of humor to highlight the serious responses).

Chart of Goals

for a

Future School

Goals	General Ideas
1. How to cope with the changing world	Goes without saying that what we learn should somehow help us in our future life time.
2. Teach current events - how to interpret them, how they effect our future.	Be more aware of the going ons in the world so they may become interested in other areas for future study and possible job opportunities.
3. Learn what special gifts and talents people have and how to use them for the betterment of the world.	The purpose of this is to place students in things they enjoy and are good at. This may lead to jobs.
4. How to use research material	
5. Electronics may (should) revolutionize education	The use of computers and how to use them may intrigue the uninterested learner.

Education - Thoughts and the Future*

"Children should be taught more about the technology they will have to grow up with." Bobby Giancola

"Too much history will create a world full of re-actionists." Bobby Giancola and Danny Suwyn

"The last years of High School will determine what career I will choose to follow through college. The subjects made interesting to me will probably be what I will choose as a career." Bobby Giancola

"I feel that students should be given a practical knowledge of the world of business and finance." John Garn III

"I think that students should be exposed to as many new things and ideas as possible. This will help to make them ready to face the multitude of new and important situations." John Garn III

"The future is what is important. We students are the future. To share the future we must be able to make intelligent desicions that will effect our lives. Common sense and the ability to accept other people as they are are two of the most important things school should teach." Danny Suwyn

"Teaching in future years should be geared to meet every students needs." Raymond Leto

*quoted from "The Diary of Humanities", authors B.G., J.G., D.S., R.L.

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The following list of suggestions was generated by Joseph Beach, Timothy Ikeda, Christopher Luft, Jeff Santucci and David Roberts. It is of interest to note that this response - unlike the others - refers to the process and implementation of change and the necessity of refining, altering or discarding curriculum as and when appropriate.

Suggestions on the Improvement of School Curricula and Teaching.

In researching this project, we have found that some major changes need to be made in the present school system. These changes must be made by all people concerned with school i.e., the school board, concerned students, parents, and administrators.

Some changes that we suggest are:

1) PERSONAL ECONOMICS,
Learning to fill out tax forms, how to balance checkbooks, investments, etc.

2) SEX EDUCATION,
Birth control methods, planned pregnancy, etc.

3) CURRENT EVENTS, FIELD TRIPS,
These should be included in at least one required course a year for all high schools. Current events should be discussed as they pertain to the course. Field trips, could be made to find out more about current events, courses studied, etc.

4) TAILOR THE COURSE TO THE INDIVIDUAL,
This would be for the individual, who, being far ahead of the rest of his classmates, could do extra work of his own choosing in order to get extra credit. This would not be one course for one person, but a course for an entire class to pursue their interests within a given field.

5) MORE LANGUAGES,
Teaching more languages like German, Latin, etc.

6) BASIC REPAIRS,
This course could be taught in conjunction with Home Economics to learn how to repair a blender, lawnmower, etc.

7) ABILITY TO FIND INFORMATION,
This would be taught as a pre-Research Paper course, or as an introduction in order to improve library or research skills, etc.

While we realize that innumerable gaps remain because of our time and research limit, among others, for the present 5th grader these courses may be refined or altered as time determines. For example, in personal economics: right now the ability to balance a checkbook is sorely lacking and needs to be taught. However, in 5 years, maybe nobody will know how to fill out a deposit slip, and the course could concentrate on that aspect. Or maybe a course could become obsolete. In short, as time necessitates, our suggestions could be refined, altered, or simply discarded. But we, the undersigned, agree that they need to be implemented in our present school system NOW.

Summary of Alternatives

This section presents the results of an analysis of futures concepts and impacts as seen by both "experts" and students and lists some recommendations for future-oriented education. Again, the reader is reminded that the listing is not meant to be all-inclusive, but rather representative of the state-of-the-art of future-oriented education.

The five "expert" sources yield a list of 34 items, made up of future-oriented directives, characteristics, goals, competency areas, and themes. The analysis determined the extent of agreement among items and among groups of items, using a matrix and referring to each source for intended definitions. Two questions were asked: What percent of elements of items of a given group are included in other items? What percent of elements of items are included in a given group?

Since very few items are identical among groups, and since an item in a given group is not necessarily exclusive of other items in that group, the degree of inclusion ranges from very high to only moderate. An example may clarify this point. A characteristic identified by Shane is "mass media control." This item is perceived as containing elements of 8 of the 34 items making up the five groups (e.g., psychological education and social discipline). Elements of mass media control are in turn included in 14 of the 34 items (e.g., rejection of basic premises and thinking clearly). Although each item was analyzed independently, results are reported for groups of items in Table 1. In this table "group" is the cluster of items listed by a given author or editor, "item" is a goal, characteristic, directive, theme or competency area as identified by the author or editor; and "element" is an essential component of a given item.

Table 1
Extent of Agreement among Items

Author/editor	Grouping	# items	% of group items included in all items	% elements of all items included in group
EPRC	directives	5	48	69
Shane	characteristics	7	45	79
Weinberger	goals	10	78	75
Kauffman	competence areas	6	83	44
Heathers	themes	6	77	64

This table shows that 83 percent of the elements in Kauffman's competence areas are included in all items. Elements of Weinberger's goals and Heathers' themes are next highest in inclusion, scoring 78 percent and 77 percent respectively; 48 percent of the elements of the EPRC directives and 45 percent of elements of Shane's characteristics are included in all items.

Shane's characteristics include elements of 79 percent of the items. Weinberger's goals contain elements of 75 percent; the EPRC directives contain elements of 69 percent; Heathers' themes contain elements of 64 percent; and Kauffman's competence areas contain elements of 44 percent of the items.

TABLE 2

Groupings of Alternatives Items Identified by Experts

KNOWLEDGE	SKILLS	DISPOSITIONS	PRESCRIPTIONS
macro/crisis problem(s) (E1,H1)	problem-solving (H6,W1)	alter/evaluate premises (E3,H2)	career ed. (W4)
alternative futures (H3)	self-managed learning (W2)	respond to change (H4)	citizen ed. (W5)
access to information (K1)	thinking clearly (K2)	social responsibility (H5)	values ed. (W7)
man and environment (K4)	communicating (K3)	*meet varying demands (E5)	psychological ed. (W8)
man and society (K5)	interpersonal/group skills (W6)	copes with uncertainity (E6)	leisure ed. (W9)
	personal competence (K6)	*sense of national purpose (E4)	
		social discipline (S1)	
		non-materialism (S2)	
		technological rethink (E3,S3)	
		biosphere concern (S4)	
		equity in democracy (S5)	
		population control (S6)	
		mass media control (S7)	
		competency motivation (W3)	
		future-focused role (W10)	

Key: E = EPRC
S = Shane
W = Weinberger
K = Kauffman
H = Heathers

*dispositions for leaders in government and/or education rather than dispositions to be introduced to students.

Table 2 groups the items identified by experts under four headings. Each item is included only once, and is placed under the heading to which it seems to be most strongly related, although it may very well fit under another heading also. Items are abbreviated in order to tabulate them concisely. The letter(s) and number(s) following each item identify the author or editor by first initial and sequential position of the item as originally presented.

TABLE 3

Groupings of Alternatives Items Identified by Students

KNOWLEDGE	SKILLS	DISPOSITIONS	PRESCRIPTIONS
History (G)	Reading (O,G)	social responsibility (O,G,L)	Animal/garden care (O)
Current events (L,B)	Writing (O,G)	personal pride (O)	Elective courses (G)
Access to information(L,B)	Arithmetic (O,G)	individual motivation (O,G,I)	Sex ed. (B)
Technology (L)	Life skills (G)	*minimum achievement standards (G)	Field trips (B)
Business/finance (L)	Decision-making (L)	*ability grouping (G)	
Foreign languages (B)	Personal economics (B)	*smaller classes (G)	
		*well trained teachers (G)	
		*individual needs (G,I,B)	
		coping with change (L)	
		acceptance of others (L)	

Key: O = Olsen
G = Griffith, Petrucci, Clark and Smith
L = Leto, Sawyn, Giancola, and Garn
B = Beach, Ikeda, Luft, Santucci, and Roberts.

*Dispositions for leaders in government and/or education rather than dispositions to be introduced for students.

Table 3 groups items identified by students, using the same method and format as that used for Table 2.

The contents of Tables 2 and 3 may be synthesized into recommendations. Although the recommendations are numbered for ease of reference later, ranking is not intended . Items identified as prescriptions are not included. The directive relating to development of a sense of national purpose is not included. The letter/number references used in Tables 2 and 3 are given in the recommendations.

1. Ensure that all students have access to information (K1, L, B) according to their individual needs (E5, G, L, B). Since teachers may be information sources ensure that they are knowledgeable and well-trained (G).

2. Provide information relating to man and environment (K4), including such topics as use of technology (E3, S3, L) and the biosphere (S4); teaching decision-making skills (L); and encouraging evaluation of basic premises (E2, H2).
3. Provide information relating to man and society (K5), including such topics as population (S6), mass media (S7), non-materialism (S2), history (G), current events (L, B), business and finance (L), and personal economics (B); teaching life skills (G); and encouraging a disposition toward individual acceptance of social responsibility (H5, S1, O, G, L).
4. Provide information about crisis problems (H1) and/or the macroproblem (E1); teaching problem-solving skills (H6, W1) possibly allied with interpersonal and group skills (W6); and encouraging individual competency and motivation (W3, O, G, L) in order to cope with uncertainty and change (H4, E6, L).
5. Within any and all subject areas provide information and/or skills for identifying alternatives - past, present, and future (H3); encouraging development of a future-focused role-image (W10).
6. Within any and all subject areas teach and encourage application of basic skills (O, G), thinking clearly (K2), communicating effectively (K3), which could include foreign languages (B); and encouraging self-managed learning (W2), a sense of personal pride in achievement (O), and acceptance of others (L).

7. Set minimum achievement standards (G) in basic skills (O, G) and personal competencies (K6), having smaller classes if necessary (G), taking into account variation among ability groups (E5, G), and possibly the principles of equity in democracy (S5).

Exercise:

Either develop your own recommendations by force-fitting as many items as possible from Tables 2 and 3, or use the recommendations given above (presented as numbers only on the chart).

Using the chart on the next page, identify which, if any, recommendations are in force in a school district or school with which you are familiar; identify the grade levels in which the recommendations are followed; and indicate under "comments" whether or not you consider the recommendation to be desirable, and if so which groups of students could benefit if the recommendations were followed.

Select a recommendation (or element of a recommendation) which you consider desirable but which is not in force in your chosen district or school. Use that recommendation as the focus of a future wheel (see Module 2 of Unit I), and generate needs and consequences if that recommendation were to be enforced within the next school year.

Follow through by outlining a plan of action to enforce the recommendation based on the contents of the future wheel if you wish.

Alternative:

Select one or more of the prescriptions from Tables 2 and 3. Identify major considerations relevant to your district or area. Referrring to the seven recommendations determine how you could use the prescription, following relevant recommendations and keeping in mind appropriate considerations. Use a matrix if you wish.

Checklist Chart for Recommendations

Recommendations	In force Yes	In force No	Used in grades ...	Comments
1.				
2.				
3.				
4.				
5.				
6.				
7.				

Module 3
Futures Studies

Future studies is a relatively new offering in schools; the earliest courses were introduced in the mid 1960s. In Toffler's Learning for Tomorrow, published in 1972, an appendix by Billy Rojas and H. Wentworth Eldredge reports that only 22 schools offered futures studies courses for one or more grades kindergarten through 12. In 1977 the World Future Society's compendium, The Future, listed 44 courses, but Richard B. Stock, in an article in the May-June 1977 issue of the World Future Society Bulletin, documented 184 secondary schools which had provided futures studies instruction in 1973 or 1974. Interest and activity in the field are expanding, but since almost all such courses are "grass-roots," it is difficult to determine exactly how many schools are actually involved.

It is also difficult to describe futures studies in terms sufficiently general to include all courses, especially since some courses are labelled futures studies but contain little in knowledge, skills or dispositions that relates to the future. The best consensus currently available is the table of Goals for Futures Studies Programs in Stock's article referred to above. (See Table 1 page 2-3-2.)

Curriculum topics, also from Stock's article, are presented in Table 2 of Module 1 of this unit.

Futures studies may be taught in any one of three ways: a course, a unit, or by infusion. Futures studies courses, frequently offered as electives, are most popular. Futures units, presented within an existing

Table 1

Goals for Futures Studies Programs

Ranking of Suggested Goal Statements in Degree-of-Acceptance Categories

High Degree of Acceptance

1. To stimulate in students the ability to imagine and consider the implications of many alternative possible futures
2. To help students to realize that the future depends to a great extent on what is happening in the present
3. To enable students to recognize the impact of technology on society
4. To help students to realize how anticipated future changes may alter their own personal life-styles and aspirations
5. To help students search for and identify future trends
6. To strengthen students' practical ability to anticipate and adapt to change
7. To help students develop the attitude that they can be actively involved in influencing their own future
8. To help students to clarify and evaluate their own values and goals
9. To help students to clarify and evaluate society's values and goals
10. To help students understand the requirements for human survival
11. To help students develop an understanding of mankind as a single human community
12. To encourage students to commit themselves to action to improve present conditions in the world
13. To develop in students the ability to integrate ideas and information originating in diverse disciplines

Moderate Degree of Acceptance

14. To help students develop an optimistic attitude toward the future
15. To help students develop an understanding of the world as a single global system
16. To enable and motivate students to share their futures studies knowledge and insights with others
17. To help students develop human relations skills
18. To give students an understanding of some of the basic concepts and methods employed by practicing futurists
19. To help students appreciate the historic development and importance of human thought about the future

Low Degree of Acceptance

None

course of social studies or language arts, are not uncommon. Infusion of futures studies into and throughout existing courses is common but not always popular. (The consideration of limits to growth discussed earlier has a strong influence on how futures studies may be introduced in schools.)

Most futures studies courses are taught, and sometimes developed, by social studies or language arts teachers, occasionally with help from teachers in other disciplines.

Unlike preceding modules, this module does not present study topics, but describes a few selected futures studies courses as illustrative examples. These examples are not necessarily superior to other futures courses.

Recommended Readings:

Stock, "Futures Studies in U.S. High Schools."

Toffler (ed.), Learning for Tomorrow,

World Future Society, The Future: A Guide to Information Sources.

Stirewalt, "The Future as an Academic Subject."

Articles in The Futurist, December 1972, August 1976, April 1975.

"Projecting for the Future"
An Elementary School Program

This program, which began in 1971, is offered at the Fort Myer Elementary School in Arlington, Virginia, and is described in the World Future Society's compendium, The Future. It consists of mini-courses, each designed to be taught once a week for seven weeks, and includes such topics as "Aerospace for the Future," "Lifestyles 2000," and "Future Communications." Students participate in a variety of activities, often directed by outside resource persons.

"Looking to the Year 2000 A.D."
A Junior High School Course

This course is offered at the Walker Grant Middle School in Fredericksburg, Virginia and is described in The Future. It is based on science fiction stories and selected filmstrips, with frequent talks by speakers from a variety of backgrounds. The course encourages "think tank thinking" and involves student discussions, scenario writing, simulations and games, along with group work on values clarification.

"Futuristics"
A High School Course

This course, also described in The Future, is offered at Maple Heights School in Maple Heights, Ohio. In addition, many of its class activities are described in Looking Forward: A Mini-Course in Future Studies by Mary Kay Howard and Betty Barclay Franks. The course uses

films, science fiction stories, games and simulations, and involves students in a wide range of activities such as forecasting and evaluating possible, probable and preferable futures; and teaching elements of problem-solving and idea generation. The objectives are to help them anticipate, understand and cope with change; make forecasts; use leisure time constructively; and understand and design environments.

"21st Century"
A High School Course

This course at Melbourne High School in Melbourne, Florida is described in The Future. It was developed by and is taught by Priscilla Porter Griffith and is probably the first futures course offered below college level. A variety of materials introduce students to the need to study the future; values clarification for decision-making in personal and social futures; alternative futures and the impact of change factors; forecasting techniques; and creative thinking strategies. Students participate in twelve kinds of activities including small group research and discussion, and focus on social futures.

"The Future: Can We Shape It?"
A High School Course

This course was prepared by the editors of Scholastic Scope and is published by Scholastic Book Services in New York. It consists of three paperbacks. One is a 160-page book of student reading material, another a student's logbook for exercises, and the third a teacher's guide. It

is designed primarily for junior and senior high school language arts and social studies classes, and is written at a 4th to 6th grade reading level. Materials are presented in three units, "Are You Ready?," "A Look Ahead," and "Shaping the Future." Recommended study time is 10 to 12 weeks, although with inclusion of the supplementary activities suggested in the Teaching Guide, the program could occupy a full semester.

"Teaching Tomorrow Today: A Guide to Futuristics"
A High School Course

This paperback book by Ronald T. LaConte, published by Bantam Books, is a teacher's guide to key problems and issues posed by the future. The course, or parts of it, could be taught by following the suggestions given and then using materials and books commonly available in most high schools. It includes an introduction to knowledge of crisis problems and developments in technology, science, and society; application of skills relating to forecasting, idea generation, and problem-solving; and involvement in small group simulations and tasks. The course may be modified to take as little as one semester or as much as one year.

"Making Changes: A Futures-Oriented Course in Inventive Problem-Solving"

This course for grades 7-10 has been developed at Research for Better Schools. Its objectives fall under five headings: knowledge (stages of problem-solving, assumptions of futurologists, etc.), skills (evaluating the reliability of forecasts, etc.), strategies (testing an idea by writing a scenario, etc.), attitudes (increased tolerance of ambiguity, self-

confidence in power to influence the future, etc.), and dispositions (autonomous use of problem-solving strategies, etc.). Content areas covered are those usually associated with social studies or science. The program can be used to supplement the social studies, science, or language arts curriculum or it can stand alone as a 'mini-course' or full-semester elective as well as be adapted to programs for academically talented students.

Exercise:

Assume that you would like to work with teachers in one or more secondary schools to develop or use a futures studies course or unit. Use a decision tree (See Unit I, Module 2, page 13) to help you to identify alternatives in order to plan ahead. Keep in mind that all questions you generate for the tree must be answerable by either "yes" or "no."

Begin with one of the questions below.

- Shall we develop a futures studies course for a given grade?
- Shall we develop a futures unit to fit into a social studies course?
- Shall we use/adapt a futures course already developed?

Module 4
Problem-Solving

The term "problem-solving" is used so frequently and is assumed to have a common and simple definition easily and equally understood by everyone. However, even superficial research reveals many problem-solving methods, a variety of strategies for those methods, and yet more variation in the perceived purposes and outcomes of problem-solving.

Courses or programs focusing on problem-solving and/or enquiry-based study include "Man - A Course of Study," the "Productive Thinking Program," the "School Mathematics Study Group," and "Science - A Process Approach." However, although each of these and other similar courses may include topics or techniques relevant to future-oriented education, none is specifically designed for the future, nor does it claim to teach problem-solving strategies applicable to social and environmental problems that will face students.

For the sake of brevity this module describes only two problem-solving strategies, both of which have been used successfully in classrooms, and are future-oriented.

Before reading their descriptions, it is advisable to refer to at least one of the first pair of references listed below, and one of the second pair particularly if you are unfamiliar with problem-solving literature.

Recommended Readings:

Weinberger, Planning Schools for the Future, pages 32 and 42.

Rubin, The Future of Education: Perspectives on Tomorrow's Schooling, pages 1, 23, and 143.

Davis, Psychology of Problem-Solving, pages 8-9, and 12-25.

McPherson, The People, The Problems, and the Problem-Solving Methods, with particular reference to Chart One.

Inventive or Creative Problem-Solving

The problem-solving strategy outlined in this section is based on a method by Alex Osborn and Sidney Parnes and used at the Creative Problem-Solving Institute at the State University at New York at Buffalo. Its techniques come from a variety of sources, most of which are described by Stein.

Students in "Making Changes," a course referred to in the previous module of this unit, use this strategy in solving the course's open-ended future-oriented problems. Since the problems given are either assumed to be familiar to the students or are assigned together with appropriate factual information, "Making Changes" does not include the fact-finding stage common to most problem-solving strategies.

The inventive or creative problem-solving strategy is divided into stages, which in turn include a variety of techniques. Students work individually and in small groups. Group roles and skills are closely allied to success, or lack of success, in solving any one problem.

Stage 1: Looking at the problem as given, or "the mess," as Parnes calls it.

- Recognize that the problem is probably a confusion of issues.
- Identify key factors either by underlining words or phrases (if the problem is written or verbally described) or by mentally sorting the problem into its main components.

Stage 2: Stating the problem

- State the problem as a challenge beginning, "How might we ...?"
- Restate the problem in different ways to determine alternative approaches.
- Generate a final challenge statement, using broad terms and including components of "the mess."

Stage 3: Generating solution ideas

- Use any or all of the following techniques but do not stop to criticize or evaluate: brainstorm; checklist; checkerboard; attribute list; force fit; analogies.

Stage 4: Evaluating solution ideas

- Determine criteria appropriate to the problem.
- Select "favorite" ideas from Stage 3.
- Evaluate each idea on all criteria.
- Select the idea(s) that satisfy all criteria. (If necessary, weigh criteria and/or modify ideas.)
- Identify advantages and disadvantages related to the idea.
- Modify and elaborate the idea in order to increase advantages and decrease disadvantages.

Stage 5: Implementing the solution

- Identify those people who are in a position to implement the solution.
- Present the solution to the appropriate people, "selling"

the idea as strongly as possible, and outling suggestions for plans of action.

- Be prepared to help in implementing the solution, keeping in mind that action plans and implementation may present another problem which may need to be attacked with the five stage strategy.

Recommended Readings:

DeBono, Children Solve Problems.

Gordon, The Metaphorical Way of Learning and Knowing.

Osborn, Applied Imagination.

Parnes, Creative Behavior Guidebook.

Stein, Stimulating Creativity.

Value-Oriented Problem-Solving

Value-oriented problem-solving is the core of "Skills for Ethical Action," a program for junior high school students developed at Research for Better Schools. The strategy offers students "a structure by which they logically will proceed toward reasoned actions." The strategy, designed for individual application, may be reactive or inititiatory. In both cases the student is already familiar with his or her values. Reactive application is called for when values are of particular importance in a given situation. Initiatory application is called for when the student recognizes that his or her behavior does not adequately reflect his or her self-described values.

The step-by-step description below is from "Skills for Ethical Action: A Rationale."

Step 1: Identify the Value Question

In this step students describe the situation that presents a problem or that indicates they are not doing enough to show that one of their values is meaningful. They name their value which is involved and then formally state their value problem.

Step 2: Think up Action Ideas

This step asks students to brainstorm ideas for actions that might help them handle their problem. Then the students check their action ideas to make sure that they are stated specifically and that they are possible for the students to do.

Step 3: Consider Self and Others

In this step students think about how their action ideas might affect their own values, feelings, health and safety, and possessions. They get information about how others might be affected in these four areas by these action ideas. The students also think of what the general effects of their actions might be.

Step 4: Judge

The fourth step asks students to be objective as they review and summarize the information gathered in Step 3, in order to judge whether their actions would be ethical. They then change or reject those actions which they deem not ethical.

Step 5: Act

In this step students choose one of their actions they deemed ethical and make a commitment to carry out that action. They are also called upon to presevere until the action is completed.

Step 6: Evaluate

In the final step of the strategy students examine the action they have completed and ask themselves whether it was indeed ethical. They review how well they used each step of the strategy and consider the importance to them now of the value which they acted upon.

Recommended Readings:

Chapman and Davis, "Skills for Ethical Action: A Rationale."

Peters, "Concrete Principles and Rational Passions."

Wilson, Williams, and Sugarman, Introduction to Moral Education.

Exercise:

Choose one of the strategies outlined in this module and apply it to a real problem you must deal with now or in the near future. If you choose the creative problem-solving strategy, apply it to an open-ended problem for which you have no present solution. Try to overcome habit thinking, and keep in mind that during stage 3 you must not be critical of your own or others' ideas. As one of the evaluation criteria, use "future consequences," i.e., does the solution have any negative consequences for the future? If you choose the value-oriented strategy, use the initiatory application after clarifying your own values, or use the reactive application recalling a recent situation in which your values were of particular importance. In step 3 make a sincere attempt to see the point of view of other persons involved, perhaps by imagining yourself in the role of one of those persons.

UNIT III: PROCESSES OF IMPLEMENTING CHANGE

The two modules in this unit deal with the processes of introducing a future-oriented emphasis into the school program. Module 1 discusses general principles of leadership for change in an organization with emphasis on skills in group process. Module 2 discusses more specifically the problem-solving procedures that are effective in introducing future-oriented education.

There is a large fund of helpful general references that the change leader may wish to utilize as background material for this section. A few selected references are listed below.

Recommended Readings:

Bennis, Benne, and Chin, The Planning of Change.

Novotney (ed.), The Principal and the Challenge of Change.

NEA Center for the Study of Instruction, Rational Planning in Curriculum and Instruction.

Temkin and Brown (eds.), What Do Research Findings Say About Getting Innovations Into Schools: A Symposium.

Heathers, et. al , Training for Leadership in Local Educational Improvement Programs. Unit III.

Module 1
Principles of Effective Leadership for Future-Oriented Education

Taking the lead in introducing a future-oriented emphasis into a school program calls for expertise in the general processes of organizational change and either knowledge of the aims and contents of future-oriented education or knowledge of how to locate those aims and contents. This module briefly reviews these leadership principles. In addition, it addresses skills in interpersonal relations and communication that are vital to successful leadership for educational change.

Principles Concerning Change in Organizations

There is general agreement among experts on organizational change--Griffiths, Bennis, Kauffman, Carlson, Lippitt, Miles, and many others--that organizations generally are resistant to change. The reason for this is that change threatens and upsets members in bureaucratic organizations--school systems not excepted. Organizational change requires that people change. Even when jobs are not eliminated, there are usually changes in job requirements. For example, the introduction of new curricula or new patterns of organizing instruction requires that principals and teachers learn new ways of performing their jobs.

Resistance to change and the demands change makes upon members of organizations to learn new skills and perform in new ways many times result in changes introduced in form but not in substance. One example of this is when non-grade-level grouping is installed in an elementary

school but teachers still teach the grade-level curriculum to subgroups sorted in terms of grade levels. Recent studies of educational change have indicated that successful implementation of innovations is the exception rather than the rule. Most often it is a matter of pouring old wine in new bottles.

Given these facts about organizational change, what principles of effective leadership can help overcome these difficulties? The following offer some guidance.

Principle 1: Base efforts toward change on the presence of dissatisfaction within the organization. Pressures for change come from disequilibrium within a system. In a school system, disequilibrium or dissatisfaction may arise from central office personnel, building principals, teachers, students, parents, community groups, or the state education agency.

In the case of future-oriented instruction leadership may create interest by inducing staff to attend workshops and speeches by invited lecturers, or by involving them in needs-analysis projects to determine how well the current instructional program prepares students for the future. Another approach to arousing interest in future-oriented instruction is to involve parents and students in staff workshops. It is not unusual that pressures for change come from outside a school system's staff.

A brief but excellent examination of pressures for change is Kenneth Tye's "Creating Disequilibrium," in The Principal and the Challenge of Change.

Principle 2: Involve all categories of participants in the changes to be made in the full process of planning and conducting the changes. This principle rejects authoritarian leadership in deciding to introduce future-focused instruction. Instead, it encourages full participation in the decision-making process by those in the school system hierarchy who will be actually involved in implementing the change program.

The advantage of the authoritarian approach is mainly in efficiency, or getting change underway. Its weakness is that it runs the risk of bringing about changes that do not suit the needs and resources of the schools where they are introduced, and that it is apt to obtain only an unwilling acceptance and compliance by its participants.

Advantages of the participatory approach are in the active involvement of participants in planning and decision processes. Through study and discussion, prospective participants in the change program have the opportunity to arrive at changes that are well suited to school needs and resources. Also, through sharing in the decision-making process, participants are more apt to feel a personal identification with the change program and are more apt to make it succeed.

Excellent discussions and rationale for the particpatory approach, followed by a description of a planning process are given in Chapters 1, 2, 3 and 10 of The Adolescent, Other Citizens, and Their High Schools, a report of Task Force '74.

Principle 3: Employ a "consumer-centered" rather than a "product-centered" approach in deciding what changes are to be introduced. A product-centered approach fosters the use of a particular educational innovation. Very often it is promoted from outside the school system, or by a school system leader with an interest in a product. This approach is akin to a solution looking for a problem rather than a problem looking for a solution. In contrast, the consumer-centered approach begins with identifying local needs for change and then proceeds to locate, analyze, and evaluate different appropriate educational products.

The product-centered approach has several faults. First, there is the likelihood of being dominated by salesmanship and not addressing the crucial needs of a school district. Second, there is the danger that alternative products better able to meet local needs will not be considered. Third is the possibility that the criterion for product selection is quantitative evidence of its adoption and continued use elsewhere rather than qualitative evidence that relates to local needs. Finally, a fourth disadvantage of the product-centered approach is lack of local involvement in planning and implementing the change.

The consumer-centered approach normally begins with a needs analysis that identifies the types of changes that should be made. Then alternative products (procedures, programs) are examined to find one that best meets needs. Participation is high here. Again, principals and teachers most involved in the change procedures are more apt to be

fully committed to the changes selected if they take part in examining what changes should occur and how.

Principle 4: Introduce changes on a pilot basis rather than throughout the total system. The pilot-test approach involves installing a change program on a limited basis in segments of a school system such as in particular classes, grade levels, subject-matter areas, or schools. The total-system approach, on the other hand, involves introducing a program system-wide from the beginning, without a pilot test.

Pilot-test approaches rest on the assumption that a limited local test can give the total school system a good look at the innovation before deciding whether to widen its local use. One of its advantages is that it calls for limited resources, a fact that is especially important in those circumstances where money and personnel are restricted. Also, it enables a school district to initiate changes by staff members who wish to adopt them, thus ensuring a test by people favorable to the innovative changes and highly motivated to implement them successfully. Since a pilot test requires a lesser school district commitment than the total-system approach, it usually is easier to obtain support from school board, community, and staff. A pilot test has the further advantage of creating local demonstration-training sites if and when a school district desires a wider adoption of the innovation.

The pilot-test approach does have one drawback that should be noted. This is the danger that schools not in the pilot test are apt to consider the change program the property of those involved in the pilot test.

Consequently, there is the danger that they will lack interest in adopting the changes. There are two ways of avoiding this problem. One is to include the total system in the initial needs analysis and in deciding who should be involved in the pilot test. The other is to encourage schools not in the pilot test to create their own versions of the desired changes. This allows, for instance, the staff of one school to agree that the pilot test demonstrated the value of introducing a future-oriented course but to elect its own course materials when implementing such a course.

Principle 5: In planning and conducting local change programs, fully share leadership responsibility with outside experts. During the current period of educational innovation, a great deal of reliance has been placed on experts or "external change agents." Many times the local school leadership has looked to experts from universities, from educational research and development centers or laboratories, from private educational consulting firms, or from state education departments for help in selecting and installing change programs.

Given effective local leadership, external experts can play valuable roles as advisors, giving access to needed resources, assisting in the technical aspects of change programs, and offering training to staff members in performing their tasks within the change program.

The difficulty is that such experts rarely are available except on a limited-time basis and cannot provide the day-to-day leadership required in conducting any change program. Also they are bound to be seen

as outsiders rather than as people who have an intimate knowledge and sharing of the instructional process.

Knowledge About Future-Oriented Education

Anyone assuming leadership in future-oriented education needs a working knowledge of the aims and available materials in this area. This does not necessarily mean becoming an expert on education for the future. It does mean having sufficient knowledge of the area to guide others in identifying needs for change in the local program in relation to a future orientation, in identifying and evaluating resources that could meet local needs, and in helping shape the local change program.

A critical sort of knowledge about education for the future is an understanding of key themes of future-oriented instruction. Unit II of this guide, especially Module 2 of that unit, presented a concise representative sample of ideas about future-oriented education. The exercise that follows is designed to assess your familiarity with some of the ideas from that unit.

Exercise:

Check your level of familiarity or understanding of each of the items listed on the next page. If you rate yourself low for any item, you may wish to turn back to the previous unit and refresh your memory. (The items listed include general and specific topics.)

Item	Level of familiarity (check one) Low	Moderate	High
1. Kauffman's competence areas	_____	_____	_____
2. Skills identified by experts	_____	_____	_____
3. Conception of alternative futures	_____	_____	_____
4. Problem-solving strategies	_____	_____	_____
5. Dispositions for administrators identified by students	_____	_____	_____
6. Limits to growth	_____	_____	_____
7. Man and society and social responsibility	_____	_____	_____
8. Common goals of futures studies courses	_____	_____	_____

Equally important as knowledge of education for the future is knowledge of where to turn for information about its aims and available materials. A local educational leader should have a reference library on education for the future. The key reference in the library would be The Future: A Guide to Information Sources, published by World Future Society. This volume describes books, reports, films, audiotapes, games and simulations, and other materials on the future. Another document from World Future Society might be The Study of the Future. A subscription to The Futurist is an obvious part of keeping up with developments in education for the future.

For general discussion of future-oriented education, the local reference library should have the key books that are listed in the bibliography of this guide.

The local leader for education for the future also should be in contact with the regional education information center serving the school system. Such centers, generally associated with state education departments, assist school districts in locating resources (materials, organizations, people) that can meet their needs.

Finally, it is essential that the leader be familiar with legal, financial, and political considerations - both those in force and those being planned for the future, and that the leader keep the planning group informed of these considerations. Buchen's planning paper and the Report of Task Force '74 discuss some general considerations. Each leader can identify those specific to his or her state or district.

Leadership Competencies in Interpersonal Relations

Leadership in local improvement programs always requires skills in working with others. To be effective in working with school system personnel, the leader must employ sound procedures of communication and interpersonal or group processes. Always, he or she must work within the limits of the competencies and readinesses of local personnel. Often the role calls for skills in selecting and training individuals to perform essential tasks designing and conducting the change program.

Training in interpersonal relations is not a part of this program. However, some excellent training materials for establishing such competencies have been developed by the Northwest Regional Educational Laboratory in Portland, Oregon. Their title is Interpersonal Communications.

The laboratory has created a national network of trainers to conduct the two-day workshop required by the program.

A useful way for you to examine your competencies in interpersonal relations is to perform the exercise that follows. This is not a personality test but simply a checklist of some important aspects of interpersonal communications or relationships. It is evident that the competencies listed are equally important for all participants in a change program, whether leaders or teachers.

Exercise:

Directions: Check one of the boxes opposite each item. Avoid undue modesty as well as the tendency to inflate your judgments in your favor.

COMPETENCY	THOROUGHLY COMPETENT	GENERALLY ADEQUATE	NEEDS IMPROVEMENT
1. Describing your ideas and feelings to others			
2. Being perceptive of group needs, opinions, and attitudes			
3. Being able to relate to people of different cultural groups			
4. Adapting to differences in others' roles			
5. Identifying non-verbal communication cues			
6. Eliciting confidence in others			
7. Putting others at ease			
8. Being an attentive listener			
9. Being objective in dealing with others' ideas and feelings			
10. Being flexible in dealing with others' ideas and feelings			
11. Exhibiting self-assurance in interacting with others			
12. Being tactful in handling disagreements			
13. Being sensitive to others' feelings and wishes			
14. Employing approval and praise whenever justified			
15. Offering support and help to others readily, as needed			

Module 2
Problem-Solving and Planning

Leadership in fostering education for the future in a school or school system calls for following a problem-solving process that begins with analyzing the need for change and continues through selecting and installing changes to meet those needs. However, just as there are levels of leadership within the educational hierarchy, there are also varying levels of perceived needs, all strongly influenced by practical considerations. In situations like this, it is still possible that, if leaders at varying levels agree that changes can and should be made for a future-oriented education focus, two or three complimentary plans can be launched simultaneously, each feeding the other(s) by sharing results and resources.

This module assumes that the principles of leadership for change presented in the preceeding module will be followed. The focus is on identifying and meeting local needs through a participatory approach to planning and conducting educational changes.

This module presents three problem-solving strategies. The first, based on the "Making Changes" model presented in Module 4 of Unit II, is used for short-term planning to initiate specific and somewhat narrow changes. The second, based on Unit III of Training for Leadership in Local Educational Improvement Programs, is used for medium-range planning to initiate course level change. The third, based on the process described in the Report of Task Force '74, is used for long-range planning to initiate change across curricula and scheduling.

Each strategy is briefly described and its steps explained. Some exercises are suggested. A scenario accompanying each strategy illustrates the descriptions. Each scenario assumes that the leader has either used this guide or is familiar with much of the literature on future-oriented education. The planning groups or task forces in each scenario include educators, students and citizens (members of the community who may or may not be parents of students).

Short-Term Problem-Solving

The short-term-problem-solving strategy is appropriate for initiating relatively minor changes within existing courses of study for no more than three grade-levels. Changes are generally introduced into the course within one month of the first planning meeting. The planning group leader's responsibilities include teaching techniques for each stage of the strategy as needed, facilitating immediate application of those techniques, and moderating group discussions.

The strategy consists of six stages: 1) looking at the problem, 2) stating the problem, 3) collecting information, 4) generating ideas, 5) evaluating ideas, and 6) implementing the solution.

Stage 1: Looking at the problem

A confusion of issues, desires, and complaints becomes obvious. The planning group describes this "mess" in writing and identifies key problematic factors.

Stage 1 Scenario

"The 8th graders are terrible this year -- that is terrible to teach. Their ability range seems to go from genius to moron; they're drop-outs, sit-in catatonics, trouble-makers and dogmatic arguers. None of the kids seems to care about learning anything. We can't afford a new social studies course, and the textbooks we're using are dull." Mr. A. had summarized the opinions of all three social studies teachers in his school.

By the following day, a planning group made up of the three teachers, three 8th graders, two parents and a university student working with a local hotline, was formed under the school principal's leadership. For this first session, Mr. A. put his complaint into writing and made ten copies. The principal explained how the group members could explore the problem. The key problem-making factors seemed to be: 8th grade; mixed abilities; mixed (negative) characteristic; dull textbook; no money for a new course.

Stage 2: Stating the problem

Each member of the planning group generates a challenge statement implying action. Several such challenges are then combined and modified into a broad statement of the problem.

Stage 2 Scenario

In the same session in which the planning group had completed stage 1, the principal introduced stage 2 by asking each member to state the problem beginning, "How might we ..." All nine challenge statements were recorded on the blackboard. The principal then introduced the technique of verb change, inviting participants to suggest alternative action verbs for some of the challenge statements (e.g. changing the action verb in "How might we change the social studies course," (to alter/jazz-up/revive/futurize/improve etc.). Suggestions were recorded. Finally, the principal asked participants to form three groups, each consisting of a teacher, a student and a citizen, and to combine or modify the statements on the blackboard to generate a broad challenge. After sharing their statements, the group selected: "How might we use the content of the existing textbook in such a way as to motivate 8th graders of all abilities and counteract some of the apathy?" as the challenge statement.

Stage 3: Collecting Information

The planning group identifies and studies information and resources relating to the problem.

Stage 3 Scenario

At the end of the first session each group member accepted a fact-finding task. The results would be shared at the next session, scheduled one week later. The students in the group surveyed classmates to determine the kinds of activities and skills that might be desirable. Also,

each student selected one book from the principal's futures library to identify possible resources and ideas which could help solve the problem. The group's citizen members read the textbook and other future-oriented references provided by the principal. The teachers explored possibilities of using out-of-school resources and read future-oriented materials different from that read by students and citizens.

At the planning group's second session, each member gave a report summarizing the information he or she had collected. The school secretary recorded the reports, later typing them and circulating copies to participants.

Stage 4: Generating Ideas

The group generates and records many and varied ideas, using at least two methods of idea generation, and avoiding any kind of critical evaluation.

Stage 4 Scenario

The principal explained brainstorming rules. The group then brainstormed ideas while the principal took notes. The "no criticism" rule had to be enforced twice. The group generated forty ideas using this method.

Back in small groups, members set out to generate more ideas. One group used a checklist to generate ideas. One referred to the brainstorm list and force-fitted ideas from that list with other ideas from Stage 3. The third group used a matrix, listing content areas from the

textbook on one axis and future-oriented skills and dispositions on the other, to force-fit items from each axis in the impact squares.

An hour after the session had begun, almost 100 ideas had been generated and reported.

The principal then asked members to study their notes within the next three days and to come to the next session ready to discuss favorite ideas.

Stage 5: Evaluating ideas

Group members select their favorite ideas. They then determine problem-relevant criteria and evaluate their ideas according to those criteria in order to identify the most appropriate idea(s). If necessary, they may weigh the criteria and/or combine or modify ideas.

Stage 5 Scenario

Each member of the group had selected at least two favorite ideas. Some members had chosen identical ideas. The principal listed these favorite ideas on the blackboard:

Ideas: Small group activities
Problem-solving skills
Games and simulations
Action-oriented assignments
Community involvement
Relate textbook content to this town
Conception of alternatives

Referring to the problem as given in Stage 1, members identified some criteria and generated others. The principal recorded the complete list.

Criteria: cost - can we afford it?

teacher acceptability - will the teachers like it?

student acceptability - will most students like it?

time - can we fit it into the existing course schedule?

feasibility - can we develop or obtain suitable materials or resources?

teacher ability - can teachers develop or expand required skills and knowledge?

Working individually, group members made up identical criteria charts, evaluating each idea according to all criteria on a "pass," "fail" or "don't know" basis. They then combined their findings, discussing and reaching consensus on conflicting ratings. The final group criteria chart is reproduced below.

	students		teachers		school	community	
CRITERIA / IDEAS	motivation	ability levels	motivation	ability	cost	feasibility	acceptability	feasibility
Small groups	P	P	P	?	P	P	P	P
Problem solving	P	P	P	P	P	P	P	P
Games	P	P	P	?	?	?	P	P
Action assignments	P	P	P	P	?	?	?	?
Community	P	P	P	P	P	P	P	P
Textbook/town	P	P	P	P	P	P	P	P
Alternatives	P	P	P	?	P	?	P	P

The group discussed the question marks. Under the criterion of teacher ability, three ideas were questionable because pressures of time did not allow for much training. However, it was possible that a resource person from the local college contacted in Stage 3 could help teachers to learn about small group roles and skills; two inexpensive games (Futuribles, and the I.Q. Game) could be purchased; and planning group members could discuss their research from Stage 3 in greater detail so that teachers would feel confident in introducing the concept of alternative futures. The principal agreed to allow participating teachers to take a "personal day" each to read and prepare for that concept.

Action assignments could not be included. Problems of cost for transportation, insurance, and community reactions were too great to be overcome at this time. Community involvement would have to be minimized until the innovations had been validated.

Stage 6: Implementing the solution

The group combines and modifies ideas that satisfy all criteria and informs people affected by the solution. They then work out details of implementation.

Stage 6 Scenario

Members of the planning group worked alone and in small groups to develop specific ideas more fully. The group spent a fairly long session putting the pieces together. Faculty, 8th graders and their parents

attended a meeting at which the principal described the planning process and the solution. Part of this speech was written and copies sent to all 8th grade families, the local newspaper and selected members of the community.

The principal's notes are included below:

Regular textbook to be used ... exercises deleted from course ... each topic related to current local events and to trends and possible future developments ... community members working in topic-related areas invited to address students.

Each topic to evolve into local-oriented problem to be solved by students working in small groups using strategy of planning group ... strong emphasis on implications to lives of students.

Game Futuribles to be played half way through course, and I.Q. Game at end of course.

Students to form own small groups, to set group achievement standards, to grade themselves. This grade to be discussed with teacher, modified if necessary.

With class approval of any solution, that solution to be presented to appropriate community group for serious consideration.

Exercise:

Refer to the recommended readings suggested in Unit II, Module 4. Use the strategy on your own. Keeping notes and spending up to two hours to complete all stages.

Alternatively, use the strategy in a group setting, referring to the scenarios for each stage.

Consider using a cross impact matrix at the end of Stage 3 or during Stage 6, and decision trees and/or future wheels in Stage 5.

Medium Range Problem-Solving and Planning

The model used in this section is based on Unit III of Training for Leadership in Local Educational Improvement Programs. Although it was designed as a general problem-solving model to be used to attack problems of varying magnitude or complexity, it is used here to initiate change within a period of three to six months, across three grade levels and three subject areas.

On pages 3-2-12 and 13 you will find a description of the model in tabular form. In examining the table, note that at the left is a list of components of a general problem solving process. In the middle column, these components have been translated into 11 steps in planning and conducting a school improvement program. The column at the right illustrates how the 11-step model is employed in elementary mathematics.

One should keep in mind that the steps in the model are not always performed in the order listed. A task later in the task flow can sometimes be performed before one listed earlier, or two or more steps may be combined.

Task 1: Specify the school system's aims in the area of concern.

Task 1 Scenario:

After attending a series of workshops on future-oriented education, a junior high school principal conducted similar workshops for the faculty of her school. As a result, the faculty had agreed that a planning group

should be formed to initiate some future-oriented changes in language arts, math, and social studies.

The planning group was composed of one teacher from each of the curricular areas, one student from each of the three grades (7, 8, 9), one parent, a member of the town council, and the owner of a construction company. The principal was group leader.

Before the group's first meeting, the principal held a brief orientation session with the citizens and students, and shared with them some of the materials from the workshops.

At the first planning meeting, in spite of a couple of heated arguments, the following preliminary aims were agreed upon for students:

Develop a conception of alternative futures

Learn and apply some forecasting techniques

Develop a future-focused role-image

Develop a sense of social responsibility

Learn more about human society

Apply knowledge, skills, and dispositions to this town

No consensus was reached as to how these aims could be divided or combined across grades or curricula.

Exercise:

Determine the general nature of your desired changes, your target audience, probable time limitations, and existing subject areas likely to be affected by the changes. Determine preliminary aims. Determine what you would need to do in order to organize and orient a planning group if you chose to use this model in a school.

TRANSLATION OF A GENERAL PROBLEM-SOLVING MODEL INTO A TASK FLOW FOR A LOCAL CHANGE PROGRAM

Components of a general problem-solving model		Task flow for a change program	Illustration: A change program in elementary mathematics
Identifying the problem	1.	Specify the school sytem's aims in the area of concern	All students should master the four basic arithmetic operations, should learn to think in mathematics, and should enjoy mathematics.
	2.	Assess shortcomings in accomplishing these aims	Elementary students in the Blankety District score low in arithmetic skills and mathematical reasoning; math is generally disliked.
Analyzing the problem	3.	Conduct an analysis to identify likely causes of the shortcomings	With ability grouping, the low groups are taught almost exclusively via drill and memorization; the textbooks used are out-of-date; few math supplementary materials are available; many of the teachers dislike teaching math.
Searching for a solution	4.	Conduct a resources search for ways of overcoming the shortcomings identified in the needs analysis	Several reasonably priced textbook series stressing modern mathematics and mathematical reasoning are identified; cooperative teaching is identified as a way of having teachers who like math do most of the math teaching; the use of heterogenous grouping seems desirable.
	5.	Conduct a local analysis of factors favoring or opposing the adoption of each alternative solution being considered	The school board, administration, and parent representatives favor adopting modern math, eliminating ability grouping, and introducing team teaching; however, there is money only for a pilot program introducing these changes in one elementary school. The principal and most teachers in X Elementary School want to try the changes recommended.
Choosing a solution	6.	Select the change program to be introduced	The Eureka Modern Math program is chosen; the Harvard cooperative teaching plan is selected (multi-age grouping, hierarchical team organization, use of aides, informal specialization in teaching preferred subjects).

Preparing to try the solution chosen	7. Design the change program	A blueprint of the new math program is drawn up, specifying the new learning materials and how they are to be used; the organization and conduct of team teaching is spelled out.
	8. Plan and conduct the activities required in preparing to install the new program	During the spring and summer, the new materials are obtained, the staff selected for the pilot project is trained in the use of the new math materials and in the conduct of cooperative teaching. The school system and the community are oriented to the new program. Preparations are made to supervise and evaluate the program.
Trying the solution	9. Install and conduct the change program, and assess the degree of implementation of its features	As of September, the new math program is introduced in X School with consultative help from the district's central staff in implementing the program's features. During the first year of the program, reasonably complete implementation of the program is achieved, though the teachers still need a better grasp of the new math and of ways to teach it.
Evaluating the solution	10. Assess the outcomes of the program as related to its aims	Outcomes are favorable; students enjoy the program, the teachers like cooperative teaching, and achievement results show general improvement in both skills and mathematical reasoning.
Deciding on a post-tryout course of action	11. Decide on the basis of evaluative data whether to abandon, change, continue, or expand the program	Assuming the first year of the pilot program is complete and that results are as stated above, the decision probably should be to continue the pilot test for at least another year to improve program implementation and to get fuller outcome data. Personnel from other schools may want to intern in the program with the intent of adopting it later in their schools.

Task 2: Assess shortcomings in accomplishing these aims.

Task 2 Scenario

The teachers in the planning group surveyed their colleagues to determine if any elements of any aims were being taught, and if not, why they had been omitted. Students informally interviewed their peers. Citizens did background reading, and each contacted five other citizens, or community leaders, to get reactions to the idea of students becoming actively involved in the community.

Results were reported to the group. In social studies there was some course content related to human society, but without a futures focus. Math students in 8th grade learned to read graphs, but knew little or nothing about trends. In general, reaction to the aims was favorable, although some teachers were concerned about learning and teaching new areas on short notice. Students were suspicious of the aims.

Exercise:

Develop a future wheel for each of the aims you described for Task 1. What needs and consequences do you foresee if your aims are introduced in your school? Decide what tasks and methods you would assign to members of a planning group in order to accomplish Task 2.

Task 3: Conduct an analysis to identify likely causes of shortcomings.

Task 3 Scenario

The group had combined this task with Task 2. Members reported that teachers had little time or inclination to develop new skills or knowledge unless they could be excused from other duties. Through workshop activities they were persuaded of the value of the aims, but they were still concerned about pressures of time. Students, afraid of being given more assignments, wanted to know how a person could be graded on a disposition, and shied away from the idea that they were to be given social responsibilities. Community groups had never been invited to assist in educational projects, but welcomed the idea.

Exercise:

Refer to your future wheels and your own knowledge and experience in order to identify possible causes for negative reactions. Consider how they could be overcome.

Task 4: Conduct a resources search for ways of overcoming negative reactions.

Task 4 Scenario

Members of the group identified several approaches and places to begin the resources search. The students delved into the principal's library, paying particular attention to the World Future Society's The Future: A Guide to Information Sources, and descriptions and samples of course materials. After discussion with the principal and supervised by a guidance counselor, they held open seminars to discuss and define the dispositional aims. The principal approached the local information center. She also talked with district administrators about ways and means of teacher training, believing that if teachers could be included in the planning process their knowledge and confience would increase. Teachers and citizens collected information from local museums, libraries, and other agencies, and persuaded the local newspaper to print a copy of a form they had developed asking for voluntary assistance in facilitating student activity in the town. This form was published alongside an explanatory editorial about the project's aims and plans.

Although no single course or set of instructional materials was found that could without modification, accomplish the aims, many ideas and course units could somehow be put to use. The planning group recognized that they would have to develop most of the materials or methods themselves, and that teachers should be included in the development process.

Exercise:

Brainstorm a list of resources. Consider the bibliography of this guide as part of your list.

How would you organize the accomplishment of this task if you were in charge of a planning group?

Task 5: Conduct a local analysis of factors favoring or opposing the adoption of each alternative solution under consideration.

Task 5 Scenario

Members of the planning group and most other teachers were in favor of introducing the aims as given, however, the school board pointed out that almost no money was available. Another limitation was time. If the changes were to be implemented next semester, there remained exactly 12 weeks of planning time. Also, teachers in the planning group could only be freed from regular teaching duties for one hour a week for meetings. Results from the newspaper form were mixed, but did include many favorable and helpful responses.

Exercise:

Select one or two items on your list of resources. Develop a decision tree for each item, beginning with one of the following questions:

Does this resource person or agency favor my aims?
Is this resource material highly appropriate for my aims?
Alternatively, decide how you would go about conducting a local analysis.

Task 6: Select the change program to be introduced.

Task 6 Scenario

After spending considerable time organizing lists, notes and other materials, and discussing them in relation to project aims and constraints, the group decided on the following:

Grade 7 - language arts: conception of alternative futures and future-focused role-image to be developed using science fiction stories; scenario writing; and improvized drama.

- social studies: aims above reinforced through discussion of possible, probable, preferable futures arising from topics introduced in existing course.

- math: brief introduction to tables and graphs based on local statistics.

Grade 8 - lauguage arts: future-focused role-image to be developed by scenario writing and dramatization based partly on "what if ...?" discussions arising from assigned reading, and partly on individual diaries or journals set in the future.

- social studies: techniques of the future wheel and decision trees introduced and used on real personally-oriented developments and

decisions relating to topics introduced in existing course, and accompanied by discussions of implications of forecasts in terms of social responsibility.

- math: new course unit to be developed to teach techniques of trend extrapolation and comprehension of exponential growth, based on real local, state, or national statistics.

Grade 9 - language arts: new and different assigned reading, with little repetition within a class of students, to include assorted materials from many times and places, all relating to change in human society, each set or group of readings to be followed by discussions in a role-play mode to develop a conception of change and a sense of "Where do we go from here?"

- social studies: all six aims to be attempted, using a variety of materials, developing and conducting a Delphi on local environmental change, and working with local community groups.

- math: review of trend extrapolation and update on local statistics to be used by students to conduct trend analyses.

Exercise:

Develop a matrix, listing aims on one axis and specific resources on the other axis. Force fit each pair of items, using notes or symbols to identify positive and negative impacts, and needs for modifications. Use the results of this cross impact matrix to draft an outline of the specificity level used in the scenario.

Alternatively, consider how you would go about selecting or outlining a change program if you were leading a planning group.

Task 7: Design the change program

Task 7 Scenario

The outline developed for Task 6 seemed to imply that initial work would best be accomplished by subject area committees. Each member of the planning group selected a subject area and committees were formed. Included in the committees were teachers who would initiate the changes. Persons who had responded to the published form also asked to join the committees. The math group included a banker, a statistician working for a government agency, and a computer programmer. The town librarian and a reporter from the local newspaper joined the language arts group. The social studies group expanded to include a 12th grader who belonged to an environmental action group, and a curator from the natural history museum.

Each committee elected a liaison person to collect and share information with other groups. They identified affordable materials; named outside speakers to address students; and listed local agencies willing to have 9th graders observe or participate in their activities.

Exercise:

Group or categorize your changes from Task 6 in such a way that each change area or course can be designed independently. Choose one change area, identifying desirable and probable outcomes, and develop a future history tree such as that described on pages 1-2-11 -- 1-2-13 of this guide.

Alternatively determine who could design each change area and how best it could be accomplished.

Task 8: Plan and conduct the activities required in preparing to install the new program.

Task 8 Scenario

The groups obtained the necessary materials and reached agreements with resource persons and agencies. Teachers shared their acquired knowledge and skills, and presented comprehensive descriptions of their plans, including methods and materials, to the principal. Using these descriptions, the principal prepared a brochure which was circulated to parents and other citizens and agencies who had been contacted during the planning process. Also, the principal worked with district personnel and representatives of local agencies in solving insurance problems that arose in sending 9th graders outside the school.

Exercise:

Refer to your Tasks 6 and 7 results. Select two problematic change areas. Develop a future wheel for each, concentrating on "needs" arising if the change is introduced.

Alternatively, consider what planning activities would have to be conducted in order to accomplish this task.

Task 9: Install and conduct the change program and assess the degree of implementation of its features.

Task 9 Scenario

Six months after the first planning meeting, the changes were implemented. The implementation was complete and satisfactory with the exception of some problems in the 9th grade language arts course. There had been insufficient time to select and obtain all the materials the committee would have liked for that course and some of the materials that were used had been beyond the ability of students.

Exercise:

How would you assess the degree of implementation?

Task 10: Assess the outcomes of the program as related to its aims.

Task 10 Scenario

Some standardized and some criterion-referenced measures had been administered to students before and after the courses. Teachers had kept lesson logs. Results indicated that most students had shown significant progress in reaching aims. Teachers identified some needed modifications, but in general were well-pleased with the changes and the results.

Exercise:

How would you go about identifying suitable standaridized measures and/or developing criterion-referenced measures?

Task 11: Decide on the basis of evaluative data whether to abandon, change, continue, or expand the program.

Task 11 Scenario

The planning group decided that the changes should be continued with minor modifications, and revision of the 9th grade language arts course. Teachers suggested that the following year they should explore aims relating to personal competencies, interpersonal skills, and interdependence of nations.

Long-Range Planning

The model in this section is based on that presented in The Adolescent, Other Citizens, and their High Schools, the report of Task Force '74. This planning strategy is formal, comprehensive, and takes at least 18 months to accomplish. It is appropriate when changes are major, far-reaching, or such that they are influenced by or will influence factors such as the district budget, policies, regulations, or legislation. Each of the 15 tasks takes one month to complete, with the exception of Task 11, which takes apprximately three months, and Task 15 which takes place over two months. It is assumed that Task 1 will be completed in June (say of 1978) so that the program(s) can be implemented the following September (1979).

Three groups of people are involved; members of one group may or may not be members of the other two groups. The groups are referred to here by key letters:

A: District superintendent, and/or staff, and/or school personnel.

B: Planning committee made up of students, teachers, district staff, and citizens (including parents).

C: Task force including students, teachers, and citizens.

Since this strategy is very comprehensive, you should read the report of Task Force '74 if you wish to apply the model. Following the outline presented here, each task is discussed in the form of scenario notes or directives. These are deliberately sketchy, but should give you a general impression of procedures and possibilities.

Task Force '74 outline

1. (A). Develop the preliminary proposal to be presented to the school and/or district board.
2. (A). Present the proposal to the board for approval. Organize and orient the planning committee.
3. (B). Conduct preliminary studies.
4. (B). Inform the general public.
5. (B). Conduct needs assessment to determine desirable goals, programs, and outcomes.
6. (B). Identify resources and constraints.
7. (B). Develop list of tentative alternatives based on results of needs assessment and identified resources and constraints.
8. (B). Survey students, parents and teachers to identify preferred alternatives.
9. (B). Determine final list of options with plan for staffing and budget allocations.

   (A). Submit final proposal to board for approval.
10. (B). Appoint task force. Preregister students for the fall.
11. (C). Plan units of instruction for programs for each option given in the final proposal. (The original model lists 10 factors to be considered in this task.)
12. (C). Finalize plans for implementation.
13. (C). Orient students, parents, and general public.
14. (C). Implement program.

15. (B). Evaluate program effectiveness.

Task 1 (A) Develop a preliminary proposal.

Task 1 (A) Scenario

The district superintendent and his staff had spent three months putting together a proposal, a lengthy document with extensive references to considerations such as state graduation requirements and college admissions, out-of-school insurance and labor union laws, district and county policies and regulations, and funding needs.

They had also conducted trend analysis and extrapolations on student enrollment and achievement, employment needs and opportunities for the 1980's and probable developments in education.

Their target was one of the district's three high schools. The major changes they were proposing were based in part on the seven recommendations presented in Module 2, Unit II of this guide, and were influenced by the Philadelphia Parkway Project as well as the desire to incorporate work study programs into the plan. In order to allow students to take as many different courses as they wished and to allow flexibility for changing needs, they proposed that the school year consist of six sessions (each 6-8 weeks long) instead of three semesters, and that afternoon courses would mainly consist of electives, work study programs, courses taken at the local vocational technical school, and lectures or courses offered by business persons and others outside the school. All courses would be open to all students, regardless of age or

grade level.

Exercise:

Collect data relevant to your school or district and use that data to conduct a trend analysis and extrapolation. Explore educational trends and developments with special reference to probable state or federal mandates that may influence graduation requirements, course content or structure, or student grouping. Determine a target group or school and list desirable changes to be implemented two years from now.

Task 2 (A) Present the proposal to the board for approval. Organize and orient the planning committee.

Task 2 (A) Scenario

The preliminary proposal was submitted and the course changes approved. The board showed some reservations about proposed scheduling changes and the possibility that some students would choose appealing courses at the expense of their overall needs. A planning committee was organized and oriented.

Exercise:

Anticipate probable needs and consequences of some of your listed changes by using future wheels. Use the results of the wheels to determine how you might persuade the board of the acceptability and practicality of your proposal. Keep the wheels and offer them to the planning committee for Tasks 7 and 11. Consider a desirable balance in representation for the planning committee and make a tentative list of people to be included.

Task 3 (B) Conduct preliminary studies.

Task 3 (B) Scenario

The planning group leader (a district assistant superintendent) had prepared a set of information pages that included references and examples

of each of the proposed changes. Members were encouraged to conduct research of their own to identify arguments, data, or materials to support the proposed changes. These findings were shared and discussed.

Exercise:

Either refer to your future wheel or to relevant literature to identify support for your proposal. You may also wish either to develop and administer a brief informal survey among parents and students, or to interview a random sample of those groups.

Task 4 (B) Inform the general public.

Task 4 (B) Scenario

Synthesizing material from the information pages and results of Task 3, the group developed a flyer which was sent to local newspapers and radio and TV stations, mailed to parents, and distributed to agencies such as the public library. Students made posters outlining the proposed changes and invited the public to ask for copies of the flyer.

Exercise:

Using any or all materials developed or studied so far, draft advertising material for your proposal.

Task 5 (B) Conduct needs assessment.

Task 5 (B) Scenario

The planning committee developed a modified Delphi, listing desirable goals, programs and outcomes. Respondents included students, parents, teachers and other citizens. Only two rounds were conducted. Results were tabulated and analyzed.

Exercise:

Refer to the guidelines in Module 2 of Unit I of this guide and develop a Delphi of no more than twenty items relating to the goals, programs, and outcomes of your proposal. Identify respondents. Administer the Delphi and tabulate the results.

Task 6 (B) Identify resources and constraints.

Task 6 (B) Scenario

The planning group referred to the original proposal in order to identify previously determined constraints. Each member was assigned to explore one element, for instance, human resources outside the school, material resources, school facilities, etc. Reports were made to the group.

Exercise:

Determine factors that should be explored and the best source of information or method for exploring them. List assignments and exploration guidelines. Distribute them among group members.

Task 7 (B) Develop list of alternatives.

Task 7 (B) Scenario

Using the results of the Delphi and the results of Task 6, the planning group developed a complex cross impact matrix to determine possible, probable, and preferable options.

Exercise:

Develop a matrix with Delphi results on one axis and resources and constraints on the other axis. Bring each pair of items together in an impact square to determine possible and preferable options. Refer to your future wheels to make sure that you have not omitted any considerations.

Task 8 (B) Conduct a survey to identify preferred alternatives.

Task 8 (B) Scenario

The planning group developed a survey form allowing for open-ended responses and asking respondents to indicate on a Likert scale the level of desirability of each option given. Those who responded to the Delphi responded to this survey. Results were analyzed.

Exercise:

Develop a survey form similar to that described above. Identify respondents. Conduct the survey.

Task 9 (B) Determine final list of options.

(A) Submit final proposal to board for approval.

Task 9 Scenario

Referring to the results of Task 8, the planning committee outlined the final list of changes (options). The superintendent's group used this list to write a final proposal which included plans for staff development, training, and desired budget allocations. The proposal was submitted and approved with a few minor changes.

Exercise:

Refer to the results of Task 8 and list final options. Outline staffing and budget needs. Develop and submit a proposal.

Task 10 (B) Appoint task force. Preregister students for the fall.

Task 10 (B) Scenario

Two task forces with liaison were appointed, one to develop the courses, and the other to plan scheduling. Students were oriented and tentatively registered. The scheduling task force used student registration data.

Exercise:

Determine the number and kind(s) of task forces needed. Draft possible membership lists. Appoint and orient task force members. Preregister students.

Task 11 (C) Plan units of instruction.

Task 11 (C) Scenario

Referring to the resources identfied in Task 6, the group identified materials and persons that could assist them. Resource persons were invited to submit topics which they could offer students, outlines of work study programs they could run, or outlines of elective courses they could offer (no more than 6 lesson periods per elective course). Next, the group selected materials for modification, and began development of new materials. At this point the members divided into subsections each responsible for a series of related courses. Those teachers not directly participating in the first task force's identification, modification, development process were given drafts of materials as they were completed so that they could discuss with members of the planning group the teaching methods needed to implement the changes. The second task force dealt

with student scheduling and planning time tables for outside resource persons.

Exercise:

Determine how best to divide work among the task force members. Plan ways and means for ongoing staff development and training. Consider assigning one person to check results of previous tasks and to make up a file of annotated resources for future reference.

Task 12 (C) Finalize plans for implementation.

Task 12 (C) Scenario

The task force and planning group met and shared results. They then called a general meeting of all teachers and outside resource persons so that the superintendent could report on progress and outline overall results. Participants then divided into two discussion groups to ensure that all change plans and materials were clearly identified and everyone understood his or her responsibilities. A similar meeting was held for outside resource persons.

Exercise:

Accomplish the task using the method described in the scenario.

Task 13 (C) Orient students, parents and general public.

Task 13 (C) Scenario

The methods used for Task 4 were repeated. Students and parents were invited to an orientation meeting at the school.

Exercise:

Draft an information flyer.

Task 14 (C) Implement program.

Task 14 (C) Scenario

In spite of initial chaos at the beginning of school as students went through a 'drop-add' process, the changes were implemented.

Task 15 (B) Evaluate program effectiveness

Task 15 (B) Scenario

A variety of methods and measures were developed and administered to determine effectiveness of each of the changes.

BIBLIOGRAPHY

This bibliography is divided into two sections. The first section is annotated and contains references highly relevant to the content of this guide. The second section lists additional references and selected readings that might be of interest to the reader.

American Academy of Arts and Sciences Commiasion on the Year 2000. Toward the year 2000: Work in progress. Daedalus, 1967.

This special issue of Daedalus presents papers and discussions of the Academy's Commission on the Year 2000. Of particular interest to the reader might be "The Next Thirty-Three Years: A Framework for Speculation" by Herman Kahn and Anthony J. Wiener. Also included are articles on "Biological Man and the Year 2000," "Deliberate Efforts to Control Human Behavior and Modify Personality," and "The Problems of Privacy in the Year 2000."

Buchen, I. Planning paper DF-GT-111: Current and future policy and planning issues for public education. Working paper, Division of the Future, Fairleigh Dickinson University, Madison, New Jersey, 1977.

Among the issues discussed are goals (directions and discrepancies), student needs, performance and assessment, teacher performance and talent, and educational and curriculum reform.

Cornish, E. et al. The study of the future: An introduction to the art and science of understanding and shaping tomorrow's world. Washington, D. C. : World Future Society, 1977.

This book contains chapters on such topics as "The Discovery of the Future" and "Methods of Studying the Future" as well as an annotated bibliography of books about the future.

Educational Policy Research Center. Anticipating educational issues over the next two decades: An overview report of trends analysis. Menlo Park, Calif.: Stanford Research Institute, 1973.

This paper, prepared for the U.S. Office of Education, is based on the assumption that policy changes in education mainly result from external pressures, i.e., Sputnik, the war on poverty, Supreme Court decisions, etc. In all, it lists 13 "trends and developments" relevant to educational policy including such items as job changes, population shifts, greater leisure, and the increased role of teachers, parents, and students in educational decision-making.

Educational Policy Research Center. Alternative futures and educational policy. Menlo Park, Calif.: Stanford Research Institute, 1970.

This report to the U.S. Ofice of Education discusses shifts in education that may be essential if our nation is to cope successfully with world-wide change through the year 2000 and beyond. It presents a "'Tree' of Alternative Future Histories" with branches projected to the Year 2000. Education, says the report, has two main tasks in coping with future

macroproblems: changing the false premises we have been taught (about man as separate from nature, about trusting the future of the planet to autonomous nation-states, about the primacy of "economic man," etc.) and teaching all students to be competent in problem-solving (including attention to values and to inter-personal relations).

Journal of Teacher Education, Summer 1974, 25.

This issue contains 12 articles on implications of the future for education. Most of the articles grew out of a writing conference jointly sponsored by the ERIC Clearinghouse on Teacher Education and Research for Better Schools in Philadelphia. Topics include psychological requirements for living in the future, a curriculum for personalized education, computer technology, cultural neutrality and education, and implications of the future for preparing educational personnel.

Kauffman, D. L. Futurism and future studies. Washington, D. C.: National Education Association, 1976.

This book is an excellent introduction to thinking about the future. It considers alternative futures: systems and change; key issues (war, population, energy, etc.); and the "psychology of the future" stressing the adaptive individual prepared to cope with change.

Kauffman, D. L. Teaching the future: A guide to future-oriented education. Palm Springs, Calif.: ETC Publications, 1976.

This book provides a general introduction to future-relevant curriculum and instruction. Its preface states that "the main objective of the book is to provide a practical handbook for classroom teachers interested in future-oriented education." Key chapters are "The Future-Oriented Curriculum," "Systems and Simulation in the Classroom," "Global Survival," and "Society and Foresight." The book offers 22 exercises "on ways of thinking about the future, each of which has been successfully used by teachers." The Appendix, "Resources for Teaching the Future," includes a guide to books, magazines, films, and simulation games for future study. There is a bibliography of 322 items.

McClure, R. M. (Ed.). The curriculum: Retrospect and prospect. 70th Yearbook of the NSSE, Part I. Chicago, Ill.: University of Chicago Press, 1971.

This volume is of special interest to the futurist since it views curriculum in terms of past, present, and future. One section is entitled "Using Today to Look to the Future." Included is a chapter by James McDonald on "Curriculum Development in Relation to Social and Intellectual Systems," one by Harry Broudy on "Democratic Values and Educational Goals," and another by Harold Shane on "Future-Planning as a Means of Shaping Educational Change." A final section is entitled "A Confident Walk Into the Future."

National Commission on the Reform of Secondary Education. The reform of secondary education. New York: McGraw-Hill, 1973.

This report by the National Commission established by the Kettering Foundation bears only indirectly to education for the future. The changes it does recommend have greatest relevance for the futurologist concerned with greater recognition of cultural differences and attention to global education.

Phi Delta Kappan. Special issue on "Yesterday, Today, and Tomorrow," 58, No. 1, September 1976.

This issue contains 28 articles about American education, past, present, and future. The list of contributors includes Isaac Asimov, Ben Brodinsky, Harry Broudy, Willis Harman, Myron Lieberman, David Matthews, Catherine Shane, Harold Shane, and Willard Wirtz. Available for $2.00 from Director of Administrative Services, Phi Delta Kappa, Bloomington, Indiana 47401.

Rubin, L. (Ed.). The future of education: Perspectives on tomorrow's schooling. Boston: Allyn and Bacon, 1975.

Three noted social scientists--Daniel Bell, Kenneth Boulding, and Harold Lasswell, and six leading educators--Robert Glaser, Louis Rubin, Robert Scanlon, Harold Shane, Patrick Suppes, and Ralph Tyler assess the implications of political, social, and educational trends for tomorrow's schools. The authors presented their papers at a national invitational conference on The Alternative Futures of Education conducted by Research for Better Schools in Philadelphia.

Rubin, L. (Ed.). Educational reform for a changing society: Anticipating tomorrow's schools. Boston: Allyn and Bacon, in press.

This volume provides a summary of RBS' second national conference on tomorrow's schools. Contributors discuss man's relationship to man-made environments, diverse educational goals in a pluralistic society, the social/psychological implications of the education of the young, and the future federal role in education. Those addressing these issues include Elise Boulding, Urie Bronfenbrenner, Representative Shirley Chisholm, Buckminster Fuller, Jonas Salk, and Senator Richard Schweiker.

Shane, H. The educational significance of the future. Bloomington, Ind.: Phi Delta Kappa, 1973.

This brief volume presents an introduction to futurology with special reference to education. It is based on the author's interviews with 82 of the nation's leading specialists on the future. Chapters deal with "The Coming Impact of the Future," "The Future as Discipline," and "Learning Designs for Tomorrow."

Toffler, A. Future shock. New York: Bantam, 1971.

This book discusses the impact upon the individual of social and psychological changes caused by an accelerating scientific and technological revolution.

Toffler, A. (Ed.). Learning for tomorrow: The role of the future in education. New York: Vintage Books, 1974.

This volume has three parts plus an appendix. Part One is on "Images of the Future and Individual Development." Part Two presents "The Place of the Future in the Curriculum." Part Three is titled "Directions and Resources." Included is a chapter on "Teaching the Twenty-First Century in a Twentieth Century High School" and one on "Values and the Futures Movement in Education." The Appendix bears the title "Status Report: Sample Syllabi and Directory of Futures Studies."

Toffler, A. The eco-spasm report. New York: Bantam, 1975.

This volume presents the author's catalog of changes threatening our survival and his views on how change and uncertainty overwhelm the individual and lead to various forms of retreat from reality.

Weinberger, J. (Ed.). Planning schools for the future. Philadelphia, Pa.: Research for Better Schools, Inc., 1976.

This volume identifies and analyzes societal changes forecast for the decades ahead and projects their major implications for schools of the future. The initial chapter reviews future trends challenging the schools. The following chapter identifies educational goals that are relevant to preparing the learner to live effectively in the decades ahead and reviews various means for accomplishing the goals. Then follow four chapters that present alternative designs for schools of the future, stressing such themes as education for adaptability in life roles, mastery

of basic skills, school in community, and a comprehensive management system for educational change. A final chapter deals with problems of implementing any of the alternative designs. A bibliography on the future of society and education is appended.

World Future Society. The future: A guide to information sources. Washington, D. C.: World Future Society, 1977.

This is a comprehensive directory of organizations, individuals, books, educational program, films, and other resources.

ADDITIONAL REFERENCES AND READINGS

Ayres, R. Technological forecasting and long-range planning. New York: McGraw-Hill, 1969.

Bennis, W. with Benne, K. & Chin, R. The planning of change. New York: Holt, Rinehart & Winston, 1961.

Bright, J. A brief introduction to technology forecasting: Concepts and exercises. Austin, Tex.: Pemaquid Press, 1972.

Chapman, M. & Davis, F. Skills for ethical action: A rationale. Philadelphia, Pa.: Research for Better Schools, Inc., 1977.

Covington, M., et al. The productive thinking program. Columbus, Ohio: Charles E. Merrill, 1972.

Davis, G. A. Psychology of problem solving. New York: Basic Books, 1973.

DeBono, E. Children solve problems. New York: Harper & Row, 1972.

Ehrlich, P. & Ehrlich, A., Population/resources/environment: Issues in human ecology. San Francisco, Calif.: W. H. Freeman, 1972.

Franks, B. & Howard, M. Thinking futures: A cure for disease. Media and Methods, November 1974, 49-52.

Friend, B. Reaching the future through paperback fiction. Media and Methods, November 1974, 35-36;48.

Fuller, B. R. & Marks, R. The dymaxion world of Buckminster Fuller. New York: Anchor Books, 1973.

Gabor, D. Innovations: Scientific, technological, and social. New York: Oxford University Press, 1970.

Giuliano, J. R. Future studies project. Keene, N.H.: Keene, N.H. School District, n.d.

Gordon, T. J. The current method of futures research. In A. Toffler (Ed.), The futurists. New York: St. Martin's Press, 1965.

Gordon, W. J. J. The metaphorical way of learning and knowing. Cambridge, Mass.: Porpoise Books, 1973.

Group for Environmental Education, Inc. Our man-made environment series: The process of choice. Cambridge, Mass.: The MIT Press, 1973.

Heathers, G. et al. Training for leadership in local educational improvement programs. Philadelphia, Pa.: Research for Better Schools, Inc., 1976.

Hellman, H. The city in the world of the future. World of the Futures Series, No. 3. New York: M. Evans and Co., 1970.

Jahoda, M., Deutsch, M., & Cook, S. W. Research methods in social relations. New York: Dreyden, 1951.

Kahn, H. & Briggs, B. B. Things to come - Thinking about seventies and eighties. New York: Macmillan, 1972.

Kahn, H. & Wiener, A. The year 2000. New York: Macmillan, 1967.

Kettle, J. Footnotes on the future. Toronto, Canada: Methuen Publications, 1970.

Koehler, G. E. Futuribles: Games together with 288 possible futures. Nashville, Tenn.: The United Methodist Church, 1973.

LaConte, R. T. Teaching tomorrow today: A guide to futuristics. New York: Bantam Books, 1975.

Little, D. L. & Gordon, T. J. Some trends likely to affect American society in the next several decades. Middletown, Conn.: Institute for the Future, 1971.

McHale, J. The ecological context. New York: George Braziller, 1970.

McHale, J. The future of the future. New York: Ballantine Books, 1969.

McHale, J. World facts and trends: Where man is headed - A multi-dimensional view. New York: Macmillan, 1972.

McPherson, J. H. The people, the problems and the problem-solving methods. Midland, Mich.: Pendell, 1967.

Mead, S. How to get to the future before it gets to you. New York: Hawthorne Books, 1974.

Miller, D. C. & Hunt, R. L. Advent: Futures studies and research curriculum guide. San Francisco, Calif.: DCM Associates, 1973.

Morphet, E. Prospective changes in society by 1980. Report prepared for the American Educational Research Association Conference, Designing Education for the Future: An Eight-State Project, Denver, Colorado, 1969.

NEA Center for the Study of Instruction. Rational planning in curriculum and instruction. Washington, D. C.: National Education Association, 1967.

Newman, Oscar. Defensible space: Crime prevention through urban design. New York: Macmillan, 1973.

Northwest Regional Educational Laboratory. Interpersonal communications. Portland, Ore.: Northwest Regional Educational Laboratory, n.d.

Novotney, J. (Ed.). The principal and the challenge of change. Melbourne, Fla.: Institute for the Development of Educational activities, 1968.

Osborn, A. Applied imagination: Principles and procedures of creative problem-solving. New York: Charles Scribner's Sons, 1963.

Papanek, V. Design for the real world. New York: Bantam Books, 1973.

Parnes, S. Creative behavior guidebook. New York: Charles Scribner's Sons, 1967.

Peters, R. S. Concrete principles and the rational passions. In N. F. Sizer & T. R. Sizer (Eds.), Moral Education: Five Lectures. Cambridge, Mass.: Harvard University Press, 1970.

Portola Institute. Energy primer: Solar, water, wind, and biofuels. Menlo Park, Calif.: Portola Institute, 1974.

Purpel, D., & Belanger, M. (Eds.). Curriculum and the cultural revolution. Berkeley, Calif.: McCutchan, 1972.

Rosen, S. Future facts: A forecast of the world as we will know it before the end of the century. New York: Simon and Schuster, 1976.

Sarnoff, P. The New York Times dictionary of the environment. New York: Quadrangle Books, 1971.

Schaller, L. E. Understanding tomorrow. Nashville, Tenn.: Abington Press, 1976.

Shane, H. B. The educational significance of the future. Bloomington, Ind.: Phi Delta Kappa, 1973.

Spekke, A. A. (Ed.). The next 25 years: Crisis and opportunity. Washington, D. C.: World Future Society, 1975.

Stein, M. Stimulating creativity. New York: Academic Press, 1975.

Stock, R. B. Futures studies in U. S. high schools. World Future Society Bulletin, May-June 1977, 11, 1-6.

Temkin, S. & Brown, M. (Eds.). What do research findings say about getting innovations into schools: A symposium. Philadelphia, Pa.: Research for Better Schools, Inc., 1974.

Thomas, G. Futuristics and community college planning. Community and Junior College Journal, 1974, 45, 8-11.

Torrance, P. E. Future problem solving and career education. Athens, Ga.: University of Georgia, 1976.

Wallia, C. S. (Ed.). Toward century 21. New York: Basic Books, 1970.

Wilson, J., Williams, N. & Sugarman, B. Introduction to moral education. London: Penguin Books, Ltd., 1967.